Naval Research Laboratory
Stennis Space Center, MS 39529-5004

NRL/MR/7431--96-8002

Physical and Geoacoustic Properties of Sediments Collected for the Key West Campaign, February 1995: A Data Report

Kevin B. Briggs
Dawn L. Lavoie
Kevin P. Stephens
Michael D. Richardson
Yoko Furukawa

Seafloor Sciences Branch
Marine Geosciences Division

May 10, 1996

REPORT DOCUMENTATION PAGE

Form Approved
OBM No. 0704-0188

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	May 10, 1996	Final

4. TITLE AND SUBTITLE

Physical and Geoacoustic Properties of Sediments Collected for the Key West Campaign, February 1995: A Data Report

5. FUNDING NUMBERS

Job Order No. 574525806
Program Element No. 0601153N
Project No. R3103
Task No.
Accession No.

6. AUTHOR(S)

Kevin B. Briggs, Dawn L. Lavoie, Kevin P. Stephens, Michael D. Richardson, and Yoko Furukawa

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

Naval Research Laboratory
Marine Geosciences Division
Stennis Space Center, MS 39529-5004

8. PERFORMING ORGANIZATION REPORT NUMBER

NRL/MR/7431--96-8002

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

Office of Naval Research
Code 01123
800 N. Quincy Street
Arlington, VA 22217-5660

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for public release; distribution unlimited

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

Physical and geoacoustic property data were collected during the Key West Campaign as a part of the Coastal Benthic Boundary Layer research program. The carbonate sediments of the western Florida Keys represent an important site in which to study the effects of environmental processes on sediment properties. In this report, results on these sediments from five Naval Research Laboratory scientists are presented. The data were collected from carbonate sands and sand-silt-clay sediments at the Marquesas Keys, Rebecca Shoal, and the Dry Tortugas during cruises in 1994 and 1995. Separate subsections for methodology and results from each author are presented along with core and instrument deployment maps.

14. SUBJECT TERMS

acoustics, sediments, mines

15. NUMBER OF PAGES

400

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	SAR

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std Z39-18
298-102

CONTENTS

LIST OF FIGURES

LIST OF TABLES

1.0 Introduction

The Key West Campaign was undertaken as a part of the Coastal Benthic Boundary Layer (CBBL) research program, which is a 5-yr Office of Naval Research program conceived to physically characterize and model benthic boundary layer processes and assess the impact of these processes on seafloor properties that affect shallow-water naval operations (Richardson 1995). The carbonate sediments of the Florida Keys represent an important site in which to study the effects of environmental processes on the sediment properties that impact naval mine countermeasures (MCM) operations. Indeed, carbonate environments are commonly found in coastal regions which are potential world trouble spots where MCM operations can be of critical importance. The Florida Keys is the only area in U.S. waters that provides an environmental analog to a tropical, carbonate, sedimentary environment.

Over 100 scientists participated in the collection of geological, geoacoustic, biogeochemical, and oceanographic data in the waters of the western Florida Keys in February 1995. Collection of sediments and deployment of scientific hardware in these waters was conducted under permits issued by the U.S. Park Service and the National Oceanic and Atmospheric Administration. Data collection was confined to areas near the Marquesas Keys, Rebecca Shoal, and the Dry Tortugas (Fig. 1.1). In addition to the main experiment conducted in February 1995, a survey of potential experiments sites was undertaken in February 1994 by scientists of the Naval Research Laboratory (NRL) and the U.S. Geological Survey (USGS) to concentrate the efforts of the scientists participating in the 1995 experiment on a few localized sites.

This data report presents the results of sediment property and geoacoustic measurements collected during both 1994 and 1995 by five NRL scientists: Kevin Briggs, Dawn Lavoie, Kevin Stephens, Michael Richardson, and Yoko Furukawa. The report is divided into subsections exclusively devoted to the results of each of the authors. Preceding the results is the Materials and Methods section, which is similarly divided into subsections describing the unique methodology pertaining to each author's effort. Each Results subsection is prefaced by a map of the investigated areas that includes locations of the cores or deployments of equipment from which data are presented subsequently in that subsection. Kevin Briggs presents the data collected from diver cores, diver vane shear tests, and diver stereo photography. In addition to diver cores, two gravity cores from the 1994 survey are presented in his results. Dawn Lavoie and Kevin Stephens present their data collected from gravity cores and the Duomorph In Situ Acquisition System (DIAS). Michael Richardson presents in-situ geoacoustic data gathered from the In-Situ Sediment Acoustic Measurement System (ISSAMS), the Gradient-ISSAMS (GISSAMS), and Neptune. Yoko Furukawa presents the results of her measurements of geochemical properties and x-ray diffraction from diver and box cores. Other results collected by NRL scientists, such as acoustic sediment classification data, as well as results yet to be completed by the authors are not reported here, but will be presented in subsequent publications.

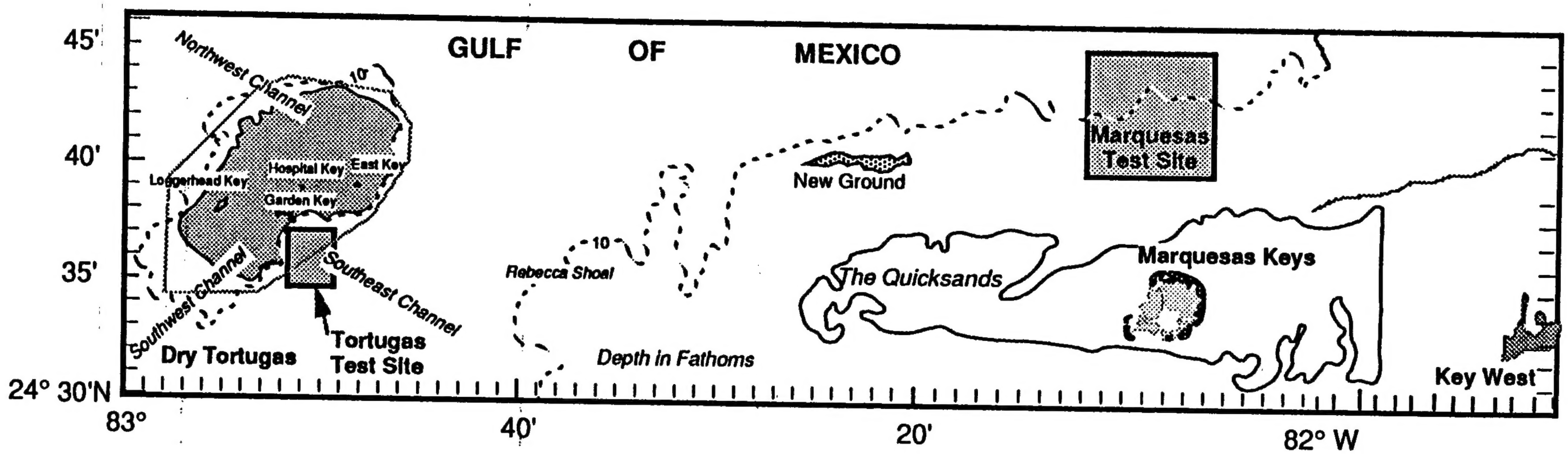


Figure 1.1 Map of the experimental sites near the Dry Tortugas, Rebecca Shoal and the Marquesas Keys.

2.0 Materials and Methods

2.1 Diver Cores, Vane Shear and Bottom Roughness Measurements (Briggs)

2.1.1 Core Collection and Geoacoustic Measurements

Geoacoustic and physical property measurements were made on 6.1-cm diameter polycarbonate plastic cylindrical cores cut at 45-cm lengths. Each core was beveled at one end to facilitate manual penetration into the sediment. Cores were capped at both ends immediately upon collection (to retain the water overlying the sediment) and kept in an upright position during transport to the laboratory for analysis. Collection, measurement, and handling procedures were designed to minimize sampling disturbance and to maintain an intact sediment-water interface within the core samples. Compressional wave velocity and attenuation were measured in the laboratory at 400 kHz for 19 diver collected cores using a pulse technique (Richardson 1986; Richardson et al. 1986). Measurements were made at 1-cm intervals by transmitting the pulse through the core liner with oil-filled rubber transducer-receivers. Sediment compressional wave velocity was also expressed as the ratio of measured compressional wave velocity in sediment to measured compressional wave velocity in the overlying water in the core (V_p ratio). Sediment compressional wave attenuation measurements were calculated as in Richardson (1986) and expressed in units of dB m^{-1} kHz^{-1}; this corresponds to the constant *k* reported in tables in the Results (Hamilton 1972). Attenuation plotted in the Results are reported as dB m^{-1}.

2.1.2 Physical Property Measurements

Porosity was measured at 2-cm intervals on the same cores using weight loss from samples in a drying oven at 105°C for 24 h. Samples were cooled in a desiccator and reweighed. Average grain density was determined with a Penta-Pycnometer on selected samples. Porosity was calculated after Lambert and Bennett (1972). Values of porosity reported in tables and plotted in the Results were not corrected for pore water salinity. Salt-free porosity values may be calculated by multiplying reported values by 1.012. Sediment bulk density appearing in tables and plots in the Results was calculated from values of sediment porosity, water density, and average grain density (Briggs 1994). Void ratio (e) was calculated by dividing the porosity value by the difference between 100 and the porosity value.

Sediment grain size was determined at 2-cm intervals from disaggregated samples by dry sieving with a sieve shaker for gravel- and sand-sized particles and on separate, undried samples by use of a Micromeritics Model 5000 Sedigraph for silt- and clay-sized particles when samples were collected from muddy environments. Prior to size fractionation, sediment samples were soaked overnight in 200 ml of dispersant solution (2.5 g of sodium hexametaphosphate per liter of distilled water), then disaggregated by sonicating the sample with an ultrasonic disrupter for 12 min while stirring with a magnetic stirrer. The disaggregated sample was wet-sieved with dispersant through a 62-µm screen to separate the sand-sized fraction from the silt- and clay-sized fraction. The finer fraction was

collected in a 1000-ml graduated cylinder, and enough dispersant was added to fill the graduated cylinder to 1000 ml. The coarser fraction was rinsed off the screen into a beaker with distilled water and then dried.

The dried, coarser fraction was fractionated into quarter-phi intervals with a sieve shaker and each fraction was individually weighed to determine the gravel- and sand-sized particle distribution. Grain size is expressed as phi units (ϕ), or the negative of the base-two logarithm of the particle diameter in millimeters. The silt- and clay-sized fraction was thoroughly agitated by vigorous stirring and aeration. A 20-ml aliquot sample representative of the total distribution of particles in suspension was pipetted from the graduated cylinder and into a preweighed beaker, dried in an oven, and weighed. Fine particle fractionation for sediments with 5% or less estimated silt and clay by weight was accomplished by taking a 20-ml aliquot at the appropriate time and depth within the graduated cylinder prescribed by Folk (1965) for the silt-clay break (8 phi). Subtraction of the 8-phi weight from the total weight yielded the silt weight. The silt weight was separated into eight equal half-phi intervals and the clay weight was separated into six equal whole-phi intervals. For samples with significant (>5% by weight) fine particle fractions, the fines were allowed to settle for 5 days before 20-ml aliquot samples were pipetted from the appropriate depths in the cylinder and into preweighed beakers, dried, and weighed to estimate the weight of clay-sized particles in the 10 to 11, 11 to 12, and 12 to 14 phi intervals. At the conclusion of 6 days of settling, all particles 10 phi and coarser were near the bottom of the graduated cylinder. At this time, the supernatant was slowly siphoned into another graduated cylinder, leaving the settled particles and about 200 ml of dispersant and sample. The supernatant volume was recorded. A 20-ml aliquot sample was pipetted from the supernatant after agitation, dried, and weighed to estimate the weight of the remaining particles finer than 10 phi. Finally, the sample remaining in the graduated cylinder was sonicated and stirred for 12 min in a beaker prior to size determination with the Micromeritics Sedigraph. The Sedigraph determines the concentration of silt- and clay-sized particles in liquid suspension at various depths in a sample cell by means of a finely collimated, horizontal x-ray beam. The concentration was presented in the form of a cumulative "percent-finer-than" distribution trace in relation to the Stokesian diameter of the particles.

Grain size distributions were analyzed and plotted as weight percent histograms and cumulative weight percent for all phi sizes through 14 phi. The fraction finer than 12 phi was equally divided between the 12 to 13 phi and 13 to 14 phi intervals to reduce skewing effects of lumping all fines into one bin. The mean grain size and sorting coefficient were calculated according to the graphic formula of Folk and Ward (1957). Sediments were divided into size classes of gravel, sand, silt, and clay using the Wentworth scale. These statistics are reported in tables and histograms in the Results.

2.1.3 Vane Shear Measurements

In-situ shear strength was measured with a diver-operated vane shear device with a vane blade 21.9 mm high by 21.9 mm in diameter. Torque was measured using a hand tool with a graduated torque scale and converted to shear strength using the assumptions and equation of Monney (1974). The

component of the torque attributed to friction between the rod and the sediment was subtracted from the total measured torque before calculating the shear strength. The frictional component was determined by performing identical torque tests with a vaneless rod. Corrected shear strength values for each trial are reported in tabular form in the Results.

2.1.4 Bottom Roughness Analysis

Stereo photographs of the sediment surface were made with a Photosea 2000 35-mm underwater stereo camera and a 100-Joule Photosea 1000 underwater strobe mounted in a molded fiberglass diver module. The diver module was mounted in a rigid 2.54-cm nominal diameter PVC frame to maintain constant focal distance and orientation with respect to the bottom. Two Nikon 28-mm water-corrected lenses were separated by 61 mm in the Photosea stereo camera system, yielding a 57.2 x 65.9-cm overlap area at the 91-cm focal distance from the camera to the bottom. Orientation of the photographs was determined by photographing a diver's compass on the sea bottom as the first photograph of a photographic transect along a tape measure previously laid down on the sea floor by divers. Transects were followed for approximately 15 m. Stereo photographs were collected of a sea floor unmodified by divers (stations 128 and 145), a sea floor gouged by divers (photographs 145-33 and 145-34), and a sea floor smoothed by divers (station 160).

All stereo photographs were recorded on 10-m strips of Kodak Ektachrome 64 film. The stereo photographs were processed as continuous rolls and examined for clarity and exhibition of representative features of the experiment site. Measurement of bottom roughness was accomplished with the photogrammetric analysis of stereo photographs by digitizing relative height measurements at regularly spaced intervals using a Benima (Hasselblad) AB photogrammetric stereocomparator. Photogrammetric software provided by Benima corrected the measurements for distortion caused by refraction in seawater and lens aberrations. Use of the stereocomparator allows high-frequency sampling of bottom roughness with an accuracy of nearly 0.1 mm. The relative orientation calculation in the photogrammetric software performed a *de facto* least-squares de-trending operation on the digitized height data. From each of 18 stereo photographs, three parallel, 53.34-cm-long relative height profiles were digitized in the same azimuthal orientation as the tape measure. The three profiles are labeled A, B, and C in the Results. RMS roughness values for each profile were calculated as the standard deviation of the relative height measurements.

2.2 Gravity Core and DIAS Measurements (Lavoie and Stephens)

2.2.1 Gravity Core Collection and Index Property Measurements

Gravity cores were collected using an NRL hydroplastic gravity corer in February 1995 aboard the *R/V Pelican* in water depths of 25-30 m. The core pipe was 3-in diameter, schedule 40 PVC in 10 ft lengths. The gravity corer was lowered until the core cutter was 10 ft from the sediment-water interface and then allowed to free-fall to the bottom. The recovered core was removed from the gravity corer, the excess pipe cut off, and the top plugged with styrofoam and sealed while still upright to preserve the top. The core ends were later sealed with paraffin wax to prevent loss of water. Also, four gravity cores collected in February 1994 aboard the *Columbus Iselin* are included. The cores collected in February 1994 have the prefix KW, while those collected in February 1995 have the prefix KW-PE-GC.

The cores were logged for compressional wave velocity and wet bulk density using Texas A&M University's Schultheiss core logger (Boyce 1976). The compressional wave velocity transducers were calibrated to distilled water at 20°C and the gamma ray detectors were calibrated to aluminum rods. The cores were then either extruded or split and subsampled at 10-cm intervals for grain size and 2-cm intervals for grain densities, wet bulk densities, and calcium carbonate content.

Wet bulk densities and grain densities were measured using Quantachrome multi-pycnometer and ultrapycnometer-1000 helium gas pycnometers (Quantachrome 1995). The pycnometers were calibrated using stainless steel spheres and checked with Ottawa sand and powdered quartz crystal standards. Samples were dried at 105° C for 24 h prior to grain density measurements. Weights used in determining densities were measured with a Mettler AE160 balance. The densities are accurate to $\pm$ 0.005 g/cm^3 and are reported to two decimal places.

Porosity (n) and water content (w) were calculated from grain density, wet bulk density, and water density (1.024 g/cm^3) measurements. Void ratio (e) was calculated from porosity values.

$$n = (DG-\rho) / (DG-DW) * 100$$

$$w = (DW/DG) * e * 100$$

$$e = (n/100) / (1 - (n/100)),$$

where DG = grain density, DW = water density, and ρ = wet bulk density.

Porosities, water contents, and void ratios are all reported to two decimal places. Calcium carbonate content (% carb.) was measured with a carbonate bomb and is reported to two decimal places (Presley 1975).

Grain size was measured by the pipette method for silt- and clay-size particles and sieve method for gravel- and sand-size grains. The sand fraction was sieved at quarter phi intervals (-2φ to 4φ) and the silt/clay fraction measured at whole phi intervals (4φ to 9φ). The silt/clay boundary used was 8φ. Mean grain size (MGS) was calculated by Folk's Graphic Mean (Folk 1974).

2.2.2 DIAS Data Collection

DIAS is an alternate technology requiring a single duomorph probe for measuring shear modulus in situ. The DIAS system consists of a duomorph probe, bottomside electronics housed in a pressure canister, and topside electronics hardwired to the underwater portions of the system.

The duomorph probe is a bending plate device that is vibrated and the resulting deflections measured. The device consists of a stainless steel plate sandwiched between a pair of piezoceramic crystals with metallic strain gauges glued to the center of each crystal (Fig. 2.1). The piezoceramic crystals are low-power, electromechanical transducers capable of converting electrical energy to mechanical energy and vice versa. When stimulated by an alternating current, the duomorph vibrates in a parabolic fashion. The ratio between the unconstrained bending of the duomorph in air and the constrained bending in sediment is a function of the sediment dynamic modulus.

The data acquisition system consists of top-side electronics, bottom-side electronics, and probe electronics. The top-side electronics, a personal computer running custom-designed software, provides data storage, signal display, system control, and data analysis functions. Communications to the bottom-side electronics are provided by an RS-422 serial interface. 150VDC power is provided by a commercial switching DC power supply. A junction box interfaces the computer and power supply to the 100-m umbilical cable.

Bottom-side electronics include an IBM compatible, single-board computer that receives control information over the RS-422 bus and performs the requested operations, a 12-bit A/D board, a programmable function generator, and a custom built amplifier. Generally, the probe is driven by a 40-V peak-to-peak 250-Hz sine wave. The frequency is chosen to stay below probe resonance and the amplitude is chosen as a tradeoff between overdriving the ceramic, which causes decoupling with the sediment and signal digitization resolution.

The DIAS system was used to measure in situ shear modulus in the Dry Tortugas and Marquesas sediments with the aid of divers pushing them to the required depths. The probes were allowed to equilibrate before measurements were recorded. Shear wave velocity was calculated using measured bulk density.

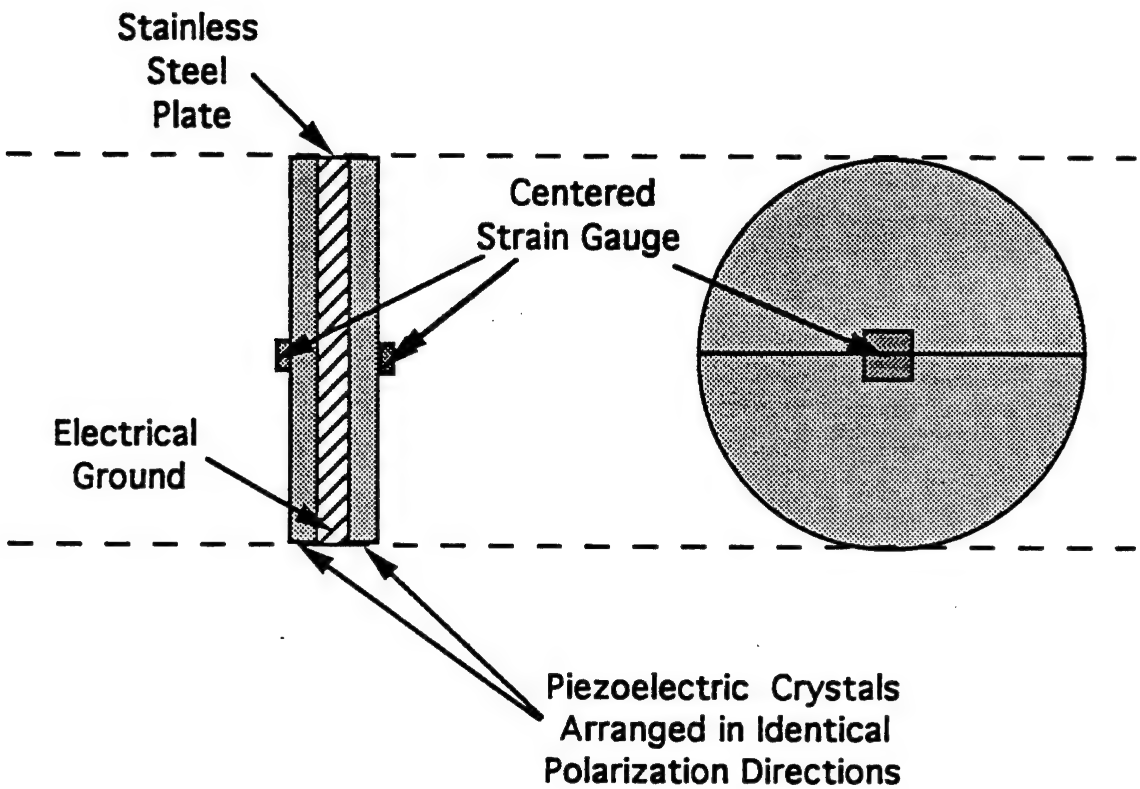


Figure 2.1 Schematic diagram of the duomorph sandwich. The piezoceramic crystals are arranged with the polarities in the same direction. Strain guages are centered on each crystal. The sandwich is excited with an alternating current which results in the parabolic vibration of the duomorph sandwich. The amplitude of the deflection is measured using the strain gauges.

2.2.2.1 Data Reduction

The methods used to reduce the sampled data are outlined below:

1. Phase and amplitude of the input and output voltages are measured by exciting the potted duomorph in air.

2. The amplitude of the in situ wave forms are directly proportional to the voltage; the displayed wave form on the computer represents the amount of dynamic strain detected by the strain gauges. The ratio of the voltage in the air to the sediment was used in the following equation to determine the modified moment ratio:

$$\left|\frac{Mc}{Mo}\right| = \frac{(es/ea) - k}{1 - k} \;,$$

where

es is the voltage (strain) in sediment under a load,

ea is the voltage (strain) in air, and

k is the electromechanical coupling coefficient, a measure of the piezoelectric effect. It is a constant dependent on disk design (for the duomorph with a 0.008-cm steel plate, k = -0.664) (Briar et al. 1976).

$$\frac{1}{k} = 1 - \frac{3\beta\, hz(hz + t)(2 + Es\; t/Ez\; hz)}{h^2\left[1 + (Es/Ez - 1)(t/h)^3\right]} \;,$$

where

$\beta = 0.5\ (1 + hm/hz) = 0.86364$,

hz = thickness of the piezoceramic crystal,

t = height of the duomorph overall,

Es = Young's modulus of steel plate, and

Ez = Young's modulus of the piezoceramic crystal.

The modified moment ratio, $\left|\frac{MC}{MO}\right|$, is a complex value having both magnitude and phase. A nomograph has been constructed that is essentially two curves sharing a common independent axis M′ for each value of the independent variable, tan ϕ. This allows us to quickly find values of M′ and tan ϕ used in the calculation of the sediment elastic modulus, E′.

$$E' = \frac{M'D}{a^3},$$

where a is the radius of the duomorph and D is the disk flexural rigidity.

Shear modulus, G, and shear wave velocity, Vs, are determined as follows:

$$E'' = E' \tan \phi$$

$$E^* = \sqrt{E' + E''}$$

$$G = \frac{E^*}{2(1+\nu)} \quad \text{(from Hamilton 1971),}$$

ν is Poisson's ratio and is estimated to be ~0.48 for Key West samples.

$$Vs = \sqrt{\frac{G}{\rho}} ,$$

where ρ is the measured density.

2.3 In-Situ Geoacoustic Measurements (Richardson)

In-situ measurements of sediment geoacoustic properties (compressional wave velocity and attenuation and shear wave velocity) were made with three systems: ISSAMS, operated from aboard ship for measurement of surficial geoacoustic properties; and two diver-operated systems designed to measure gradients of shear wave velocity (GISSAMS) and compressional wave velocity and attenuation (Neptune). The operation of each is briefly described below, followed by a description of sampling locations occupied in the carbonate sediments of the Florida Keys. Data are presented in tabular form as well as maps of the areal distribution of values of geoacoustic properties and plots of the vertical gradients of shear and compressional wave velocity.

2.3.1 ISSAMS: In-Situ Sediment Acoustic Measurement System

ISSAMS Mechanical Description: ISSAMS is an aluminum and stainless steel structure used to hydraulically deploy geoacoustic and geotechnical measurement probes in coastal marine sediments (Richardson et al. 1994; Griffin et al. 1996). The large size (3 m high, 2 m square footprint) and weight (approximately 1 metric ton) are required to make measurements over the variety of sediments found in coastal marine waters. The outer frame acts as a guide for a hydraulically driven inner frame to which four compressional and four shear wave probes are mounted. The inner frame has a 60-cm stroke allowing the probes to be completely drawn into the protective outer frame at any time during deployment. Once the ISSAMS is placed on the seafloor, probes are pushed into the sediment at depths ranging between 0 to 50 cm. This allows

for gradient measurements to be obtained. The inner frame allows for probe mounting separations of 40 to 110 cm. Around the entire base of the structure is a 30-cm-wide plate that serves a dual purpose. When ISSAMS is deployed on a soft mud, this plate increases the surface area to better distribute weight and keep ISSAMS from sinking into the sediment. On hard packed sands, however, the plate serves as a surface for attachment of additional weight to help insert the eight geoacoustic probes into the sediment.

ISSAMS Electronics: ISSAMS electronics consists of both top-side and bottom-side electronic suites connected by a single, electromechanical coaxial cable. The top-side system provides remote control, system power, storage, and display. An IBM-compatible computer system provides control, display, signal analysis, and storage. Standard NTSC color television and VCR are used to display and store real-time video of the deployment of the system and movement of the probes into the sediment. A commercially available 20-amp, 200 VDC switching power supply is used to provide 150 VDC power to the bottom-side electronics. The only custom components are a low-pass filter to reduce power supply switching noise and an interface box that combines/separates data, video, and 150 VDC power. The interface box accepts filtered 150 VDC power and an RS-422 data stream from the top-side computer, converts the RS-422 to FSK, and then combines the two signals. Output from the interface box is RS-422 data converted from the bottom-side FSK signal and NTSC video on a 64 MHz carrier (channel 3). A custom written software program integrates the system operation.

The ISSAMS bottom-side electronics consists of a hydraulic power pack, bottom-side interface electronics, Seabird CTD, black-and-white camera, color camera, a 24 VDC sea battery, computer system, and power amplifier. Most bottom-side electronics are housed in four pressure canisters. The sea battery, the CTD, and the cameras are separate, commercially available units for which interfaces have been developed. The hydraulic power pack consists of a 24-VDC-powered hydraulic motor located in a pressure canister. Control commands from the topside are received by the bottom-side computer, which controls the hydraulic motor. Position feedback information is provided by a potentiometer built into the hydraulic cylinder. Limit switches are located at the top and bottom stroke of the inner frame to stop the frame from moving past preset positions. An additional feature of the hydraulics system is automatic retraction of the probes from sediment if the 150 VDC top-side power is lost. This is a safety mechanism to protect the probes from being destroyed if an electronics failure occurs when the probes are in the sediment. Power to run the hydraulic motor is provided by the sea battery.

The interface electronics consists of an assortment of electronics. Included in this canister is an FSK modem, hydraulic control relays, DC-DC power converters, video amplifiers, and video modulators. The FSK modem converts the RS-422 data from the bottom-side computer to an FSK signal and converts the FSK signal from the top-side computer to an RS-422 data stream that the bottom-side computer accepts. The DC-DC power converters reduce the 150 VDC to the various DC voltages required by the bottom-side electronics. The hydraulic control relays perform the hydraulic control discussed in the above paragraph. These are not included in the cylinder with the hydraulic motor due to the flammable nature of the hydraulic fluid. Lastly, the video modulators and video amplifiers condition the signals from the cameras for transmission to

the topside. Control circuitry selects the desired camera, since the color camera is pointed downward to provide a view of the sediment, and the black-and-white camera is directed horizontally to provide a view of probe position.

The amplifier electronics are housed in a separate canister. Programmable gain amplifiers (0 - 60 dB) are used to amplify the probe received signals. This is in addition to the 40 dB of gain that each probe's preamplifier provides. Transmit probes are driven by a 350-watt power amplifier. These amplifiers are conduction-cooled to prevent thermal damage.

The bottom-side digital electronics system controls the functionality of ISSAMS. This unit contains a function generator, two 12-bit, 1 Msample/s A/Ds, one low-speed, 12-bit A/D, a parallel I/O card, and an IBM-PC-compatible computer system. The software running on this computer can control the pulse length, frequency, and amplitude of the transmitted shear or compressional wave signals. Signals from 20 Hz to 100 kHz are synthesized by the function generator. The receive sample rate can be adjusted from 1 ksample/s to 1 Msample/s. The high-speed A/Ds are simultaneously triggered with the function generator to provide an accurate signal velocity measurement. RS-232 serial communications are used to collect data from the CTD. The parallel I/O and low-speed A/D are used to provide feedback and control of the ISSAMS subsystems.

ISSAMS Probes: ISSAMS uses a single radial-poled ceramic element in each of the four compressional wave probes. The compressional wave probes have a modular design that allows for easy repair and for use of probe tips made of different materials. The current probes have a resonant frequency of 38 kHz, which is the frequency that most measurements are made. Both transmit and receive compressional wave probes are identical except for a 40-dB gain preamplifier in the receive probes.

The shear wave probes used on ISSAMS are single, bimorph bender elements potted in a stainless steel frame with soft urethane. A thin, higher derometer polyurethane is used as a resilient outer coating to protect the ceramic during insertion. Transmit and receive shear wave probes are identical except for a 40-dB gain preamp located in the receive probes. Frequencies from 70 Hz to 2 kHz are used to make measurements with these probes. The shear probes are mounted to the ISSAMS frame using a neoprene-filled mount to reduce mechanical coupling between transmit and receive shear wave probes.

2.3.2 GISSAMS: Gradient In-Situ Sediment Acoustic Measurement System

Gradients of sediment shear wave velocity were measured using a pulse technique and probes similar to those employed by ISSAMS (Richardson et al. 1991). Transmit and receive probes are constructed of identical 31.75-mm square x 0.48-mm thick bimorph ceramic benders. The ceramics are potted in a stainless steel ring with soft silicone rubber (hardness = 35 shore A) to allow relatively unrestricted bender movement. A thin covering of much harder polyurethane resin (hardness = 80 shore A) holds the ceramics in place and provides a tough coating to protect

the ceramics during insertion into the sediment. Shear wave probes are attached to the ends of 2.4-m hollow steel pipes and, during deployment probe orientation and distance below the sediment-water interface, are controlled by scuba divers using a PVC frame. Shear wave velocity was measured at 10-cm depth intervals and over 30- and 70-cm pathlengths parallel to the sediment-water interface. Shear waves are generated as a 2-6-cycle sine wave pulsed every 0.5 s. Driving frequency (70-1000 Hz) and driving voltage (100-230 V p-p) depends on the varying mechanical load of sediments on the compliant bender ceramic face, sediment shear wave velocity and attenuation, and the pathlength between receive and transmit probes. Received signals are amplified with 40-dB preamplifiers mounted in receiver probe heads, bandpass filtered, and recorded with a digital waveform recording oscilloscope. Shear wave velocity is calculated from the measured time delay and known receiver-transmitter separation.

2.3.3 Neptune

Gradients of compressional wave velocity and attenuation were determined using a diver-operated probe system. Neptune uses compressional wave probes identical those of ISSAMS. The probes are attached to ends of a 3-m long, stainless steel, hollow pole. Probe distance is maintained at 50 cm by a stainless steel frame. Compressional wave velocity and attenuation were measured at 10-cm intervals using a pulse technique subsequent to the divers pounding the probes into the sediment. Driving frequency (38 kHz) and driving voltage (100 V p-p) are similar to those used with ISSAMS.

2.4 Geochemical and Mineralogical Measurements (Furukawa)

2.4.1 Sediment Chemistry Measurements

Pore water chemistry was studied on selected box cores (KW-PL-BC-141, 165, 194, 208) and diver cores (KW-PL-DC-179, 180) taken on board the *WFS Planet*. Pore water samples were collected using a Jahnke-type pore water squeezer (Jahnke 1988) that prevented samples from exposure to air and subsequent oxidation. All core locations are indicated in the Results.

Pore water samples were analyzed for intermediate inorganic sulfur species and total inorganic reduced sulfur species using iodometric titration (Grasshoff 1983; Fonselius 1983) within 10 min of the completion of sampling. Major and minor cation concentrations were determined using inductively coupled plasma spectroscopy (ICP) by Chuck Holmes at the USGS Denver office. The pore water samples were also analyzed for pH within 10 min of sampling.

Total organic carbon content (TOC) was analyzed for the samples from box core KW-PL-BC-194. After the pore water was taken, the sediment samples were extruded, placed in zipper-sealed plastic bags, and stored in a freezer. The frozen samples were later analyzed for TOC at a commercial laboratory.

2.4.2 Mineralogy Analysis

Bulk mineralogy was studied on the same selected cores mentioned above (KW-PL-BC-141, 165, 194, 208; KW-PL-DC-179, 180). Each sediment sample was air-dried, ground using agate mortar and pestle, and mounted into the cavity of an aluminum sample holder for x-ray powder diffraction.

Gravity core samples from KW-PE-GC-147 were first separated into clay, silt, sand, and gravel-sized fractions using settling and siphoning, and each was prepared for x-ray diffraction. x-ray diffraction data of the size-fractioned samples from the gravity core were used to conduct the Rietveld crystal structure refinement to quantify the relative amount of high-Mg calcite (HMC) and low-Mg calcite (LMC), as well as to determine the Mg contents of HMC. The Rietveld analysis was conducted using a Rietveld program DBWS9411 (Young et al. 1994).

3.0 Results

3.1 Diver Cores, Vane Shear, and Bottom Roughness Measurements (Briggs)

Locations of diver cores (DC), in-situ vane shear measurements (SP), and stereo photographs (DP) are displayed in Figs. 3.1.1 - 3.1.3 for the Dry Tortugas, Marquesas Keys, and Rebecca Shoal sites. Figs. 3.1.4 - 3.1.7 depict the vertical profiles of sediment geoacoustic and physical properties measured at the three sites. Fig. 3.1.8 shows the in-situ sediment shear strength measured at the Dry Tortugas site.

The section denoted as Fig. 3.1.9 contains the digitized roughness profiles from stereo photographs collected at the Applied Physics Laboratory (APL) tower in the Dry Tortugas site. The following section denoted as Fig. 3.1.10 contains the sediment grain size distributions for cores collected from the three sites.

Following the sediment grain size distribution histograms is a section denoted as Table 3.1.1 consisting of sediment geoacoustic and physical property data in tabular form.

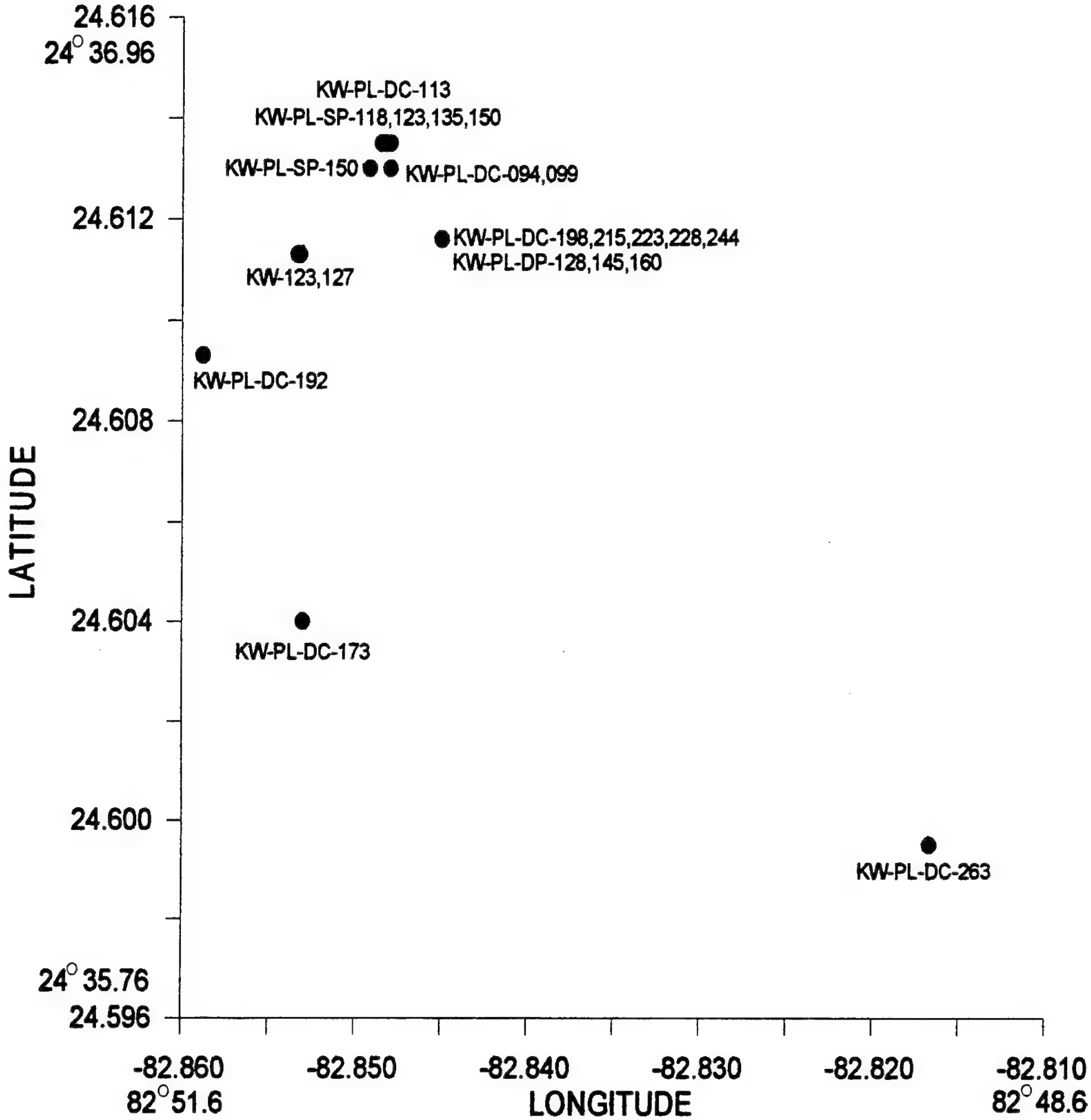


Figure 3.1.1 Dry Tortugas Test Site Diver Core and Diver Vane Shear Locations

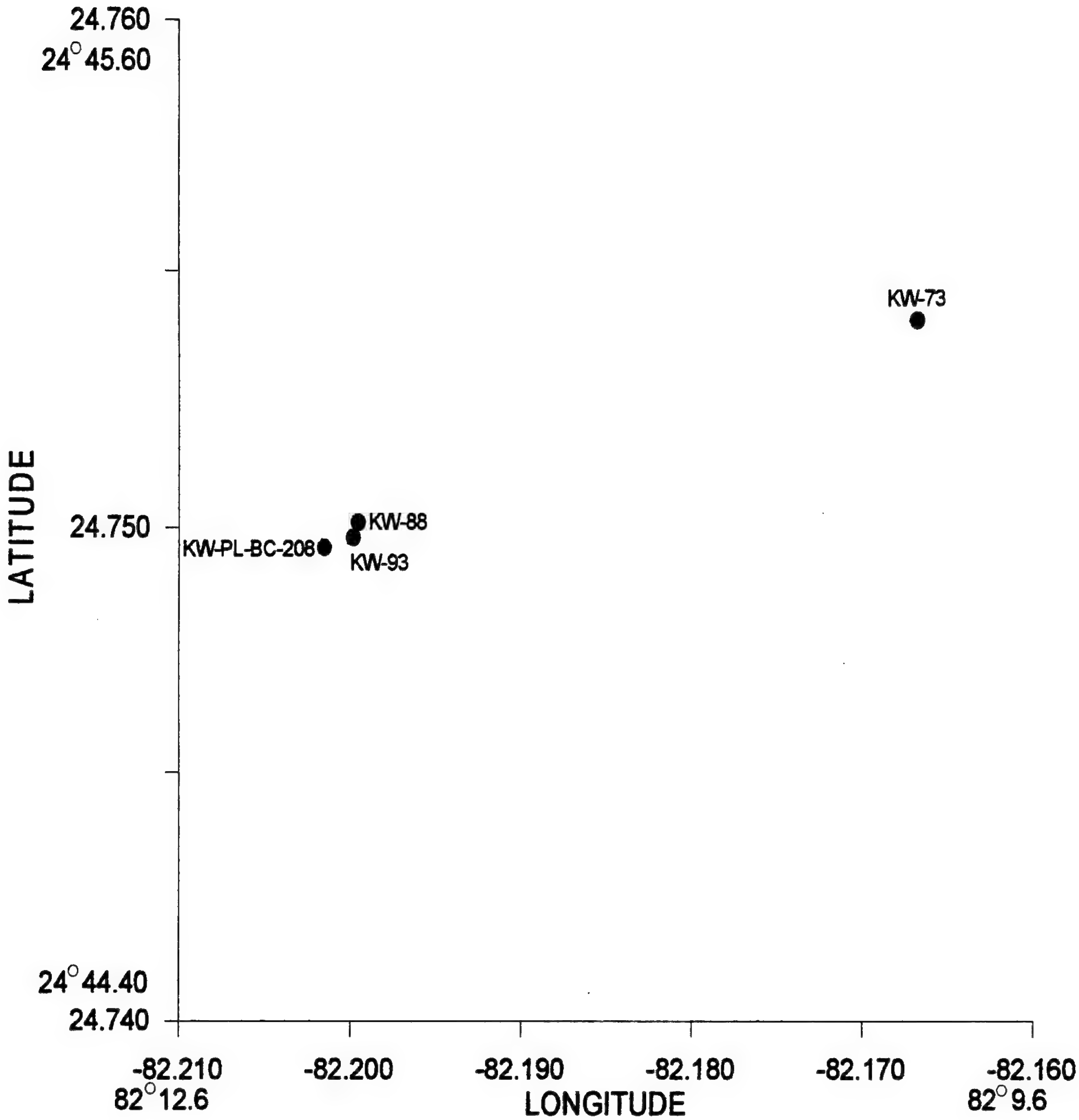


Figure 3.1.2 Marquesas Test Site Diver Core and Box Core Locations

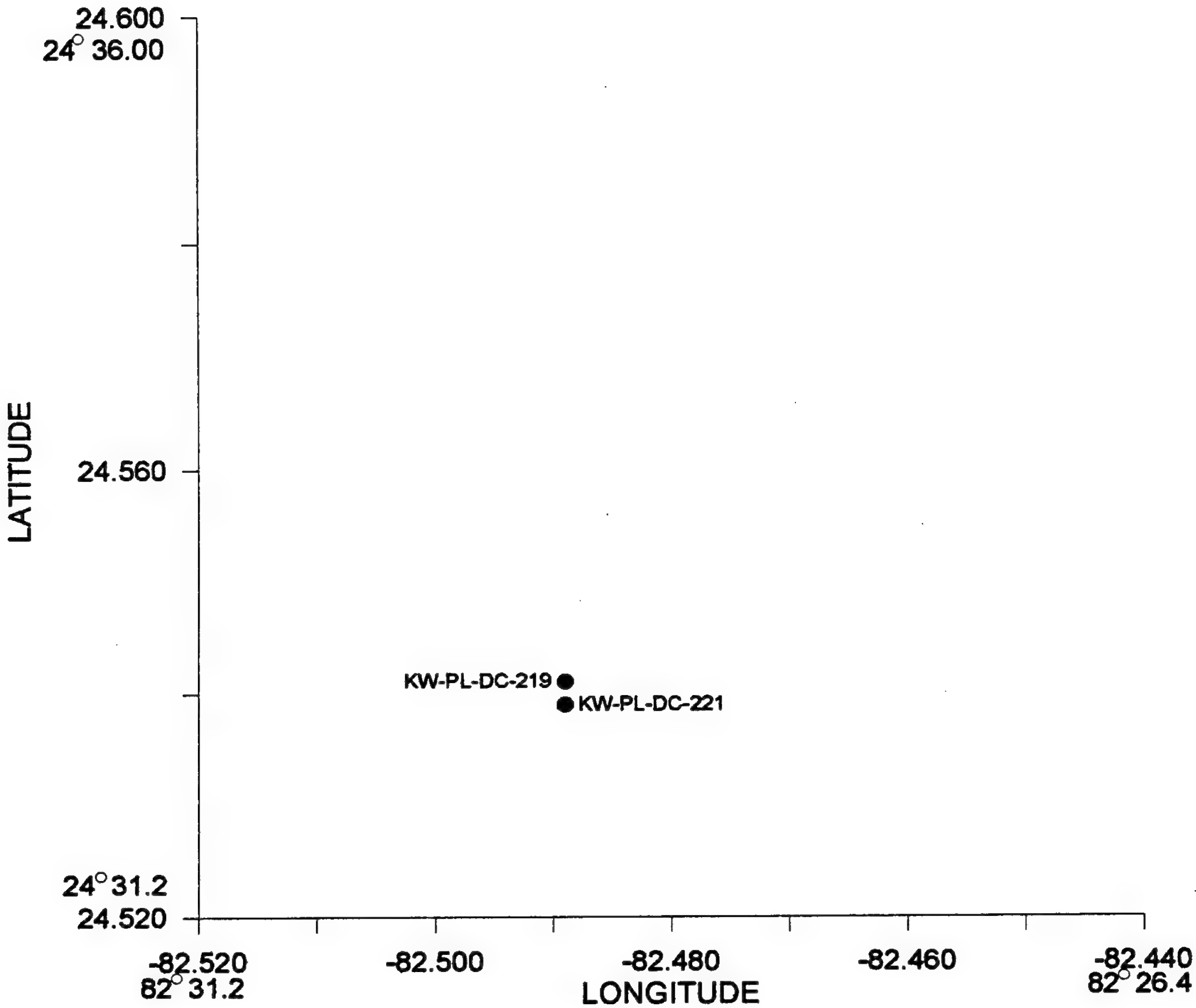


Figure 3.1.3 Rebecca Shoal Vicinity Diver Core Locations

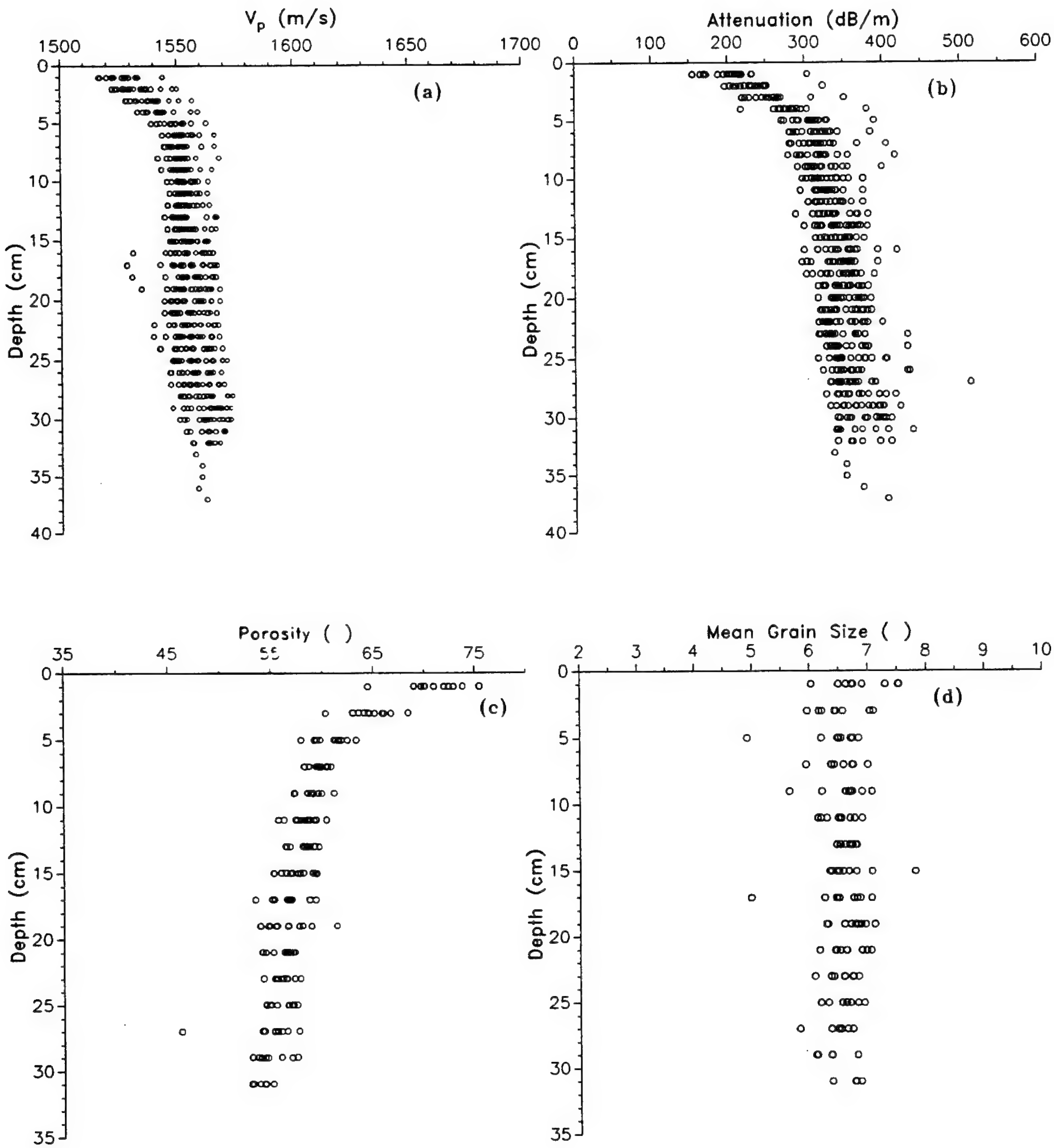


Figure 3.1.4 Depth profiles of sediment (a) compressional wave velocity, (b) compressional wave attenuation, (c) porosity, and (d) mean grain size from the Dry Tortugas site.

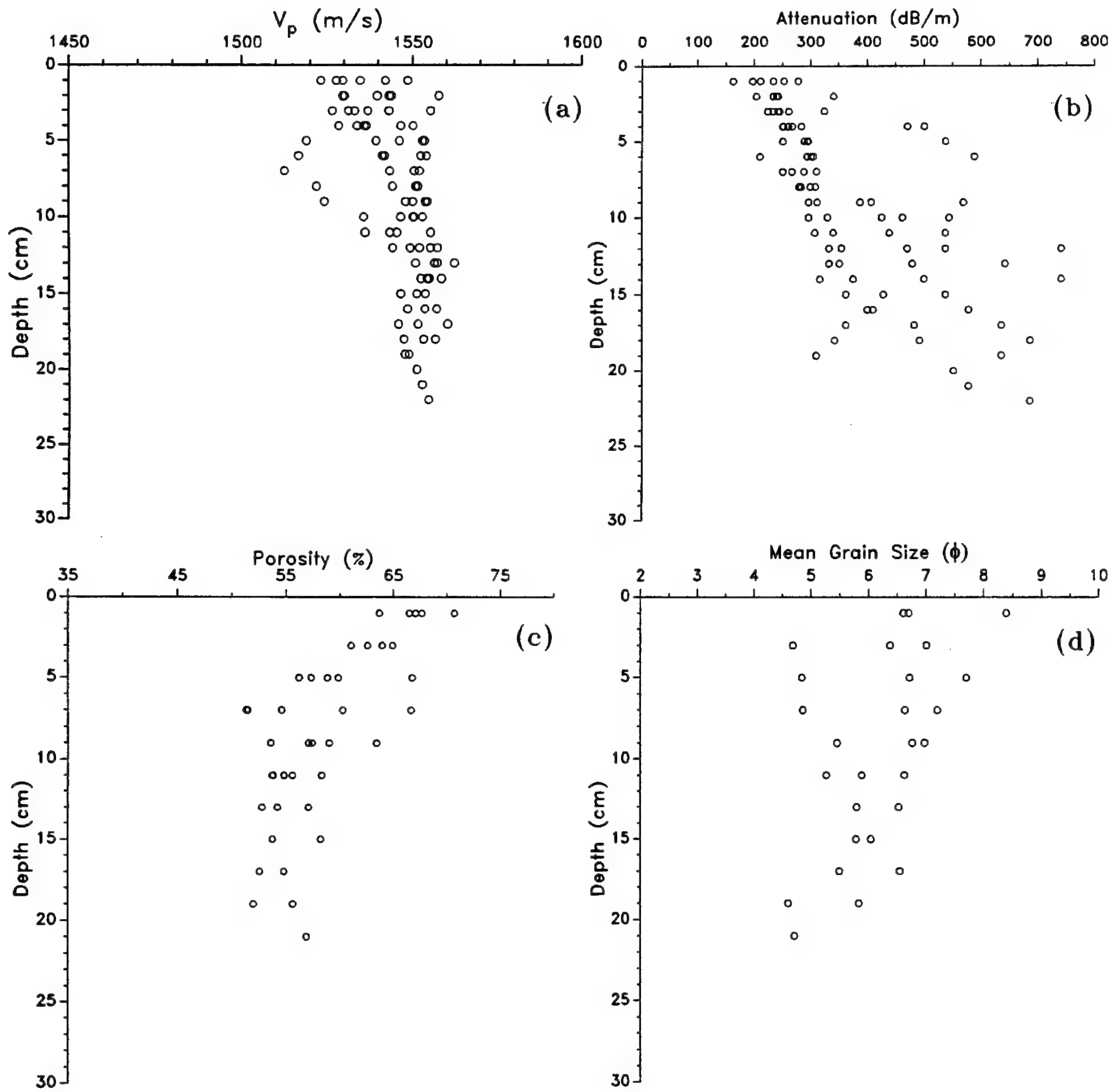


Figure 3.1.5 Depth profiles of sediment (a) compressional wave velocity, (b) compressional wave attenuation, (c) porosity, and (d) mean grain size from the Marquesas Keys site.

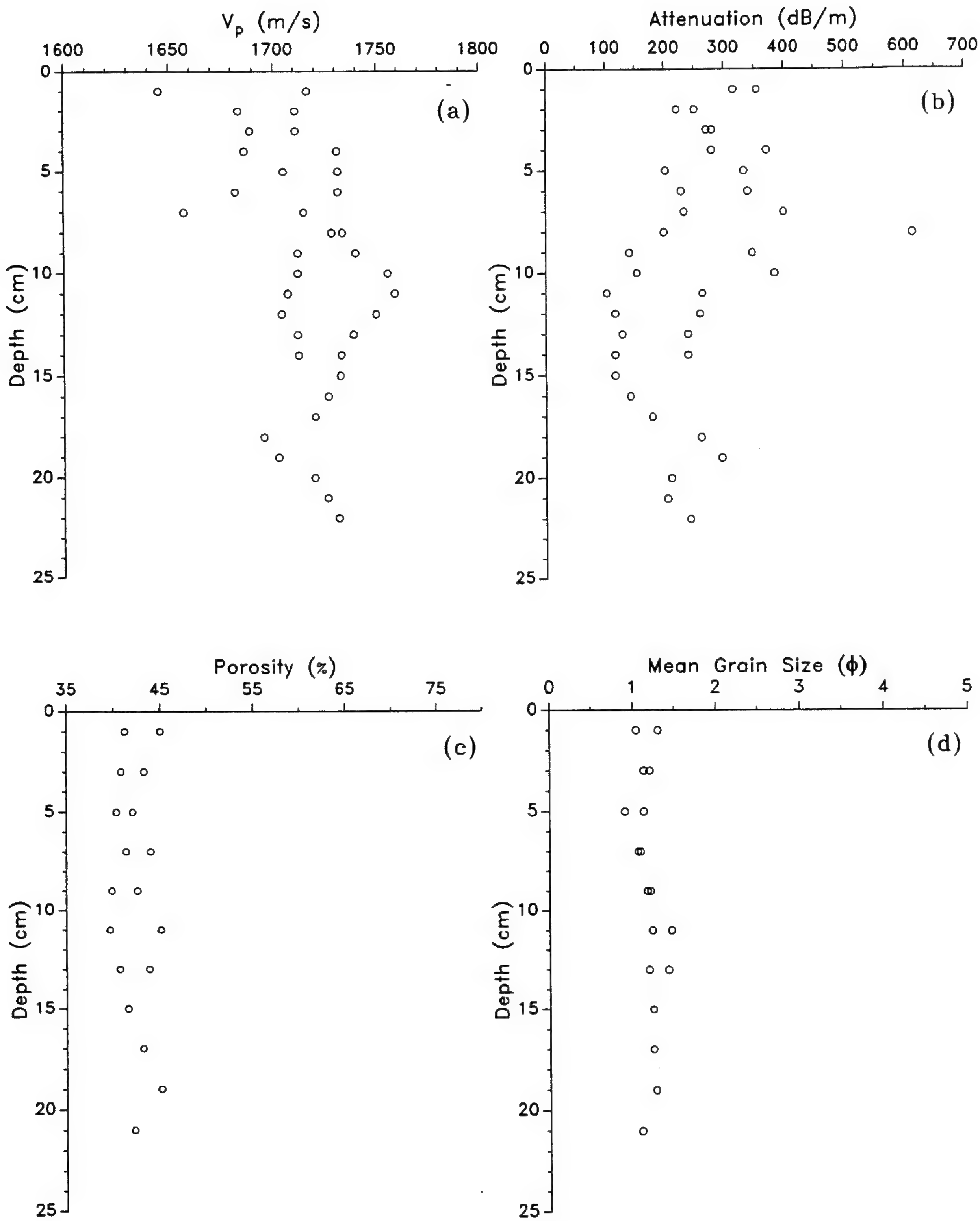


Figure 3.1.6 Depth profiles of sediment (a) compressional wave velocity, (b) compressional wave attenuation, (c) porosity, and (d) mean grain size from Rebecca Shoal.

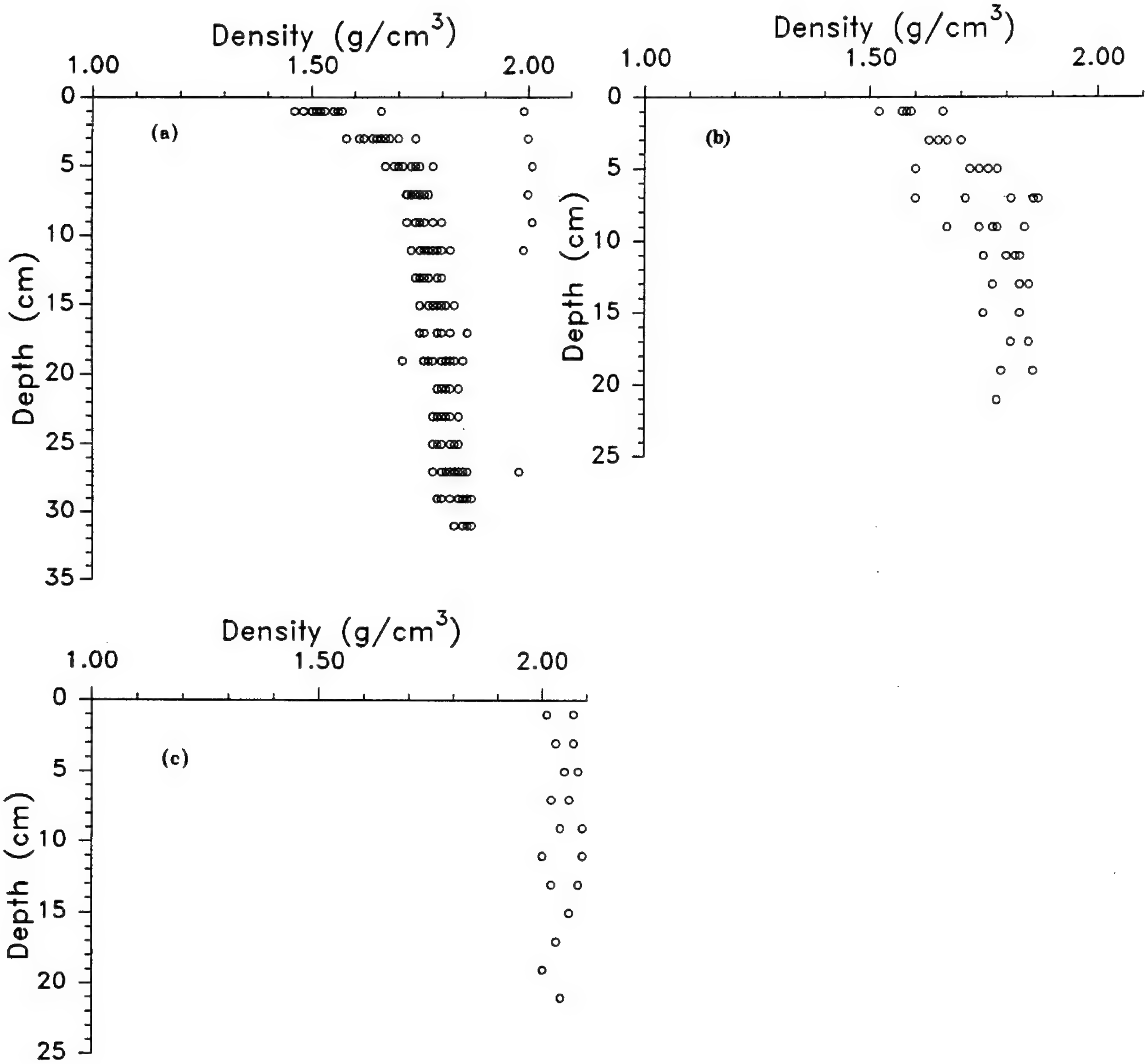


Figure 3.1.7 Depth profiles of sediment bulk density from (a) Dry Tortugas site, (b) Marquesas site, and (c) Rebecca Shoal.

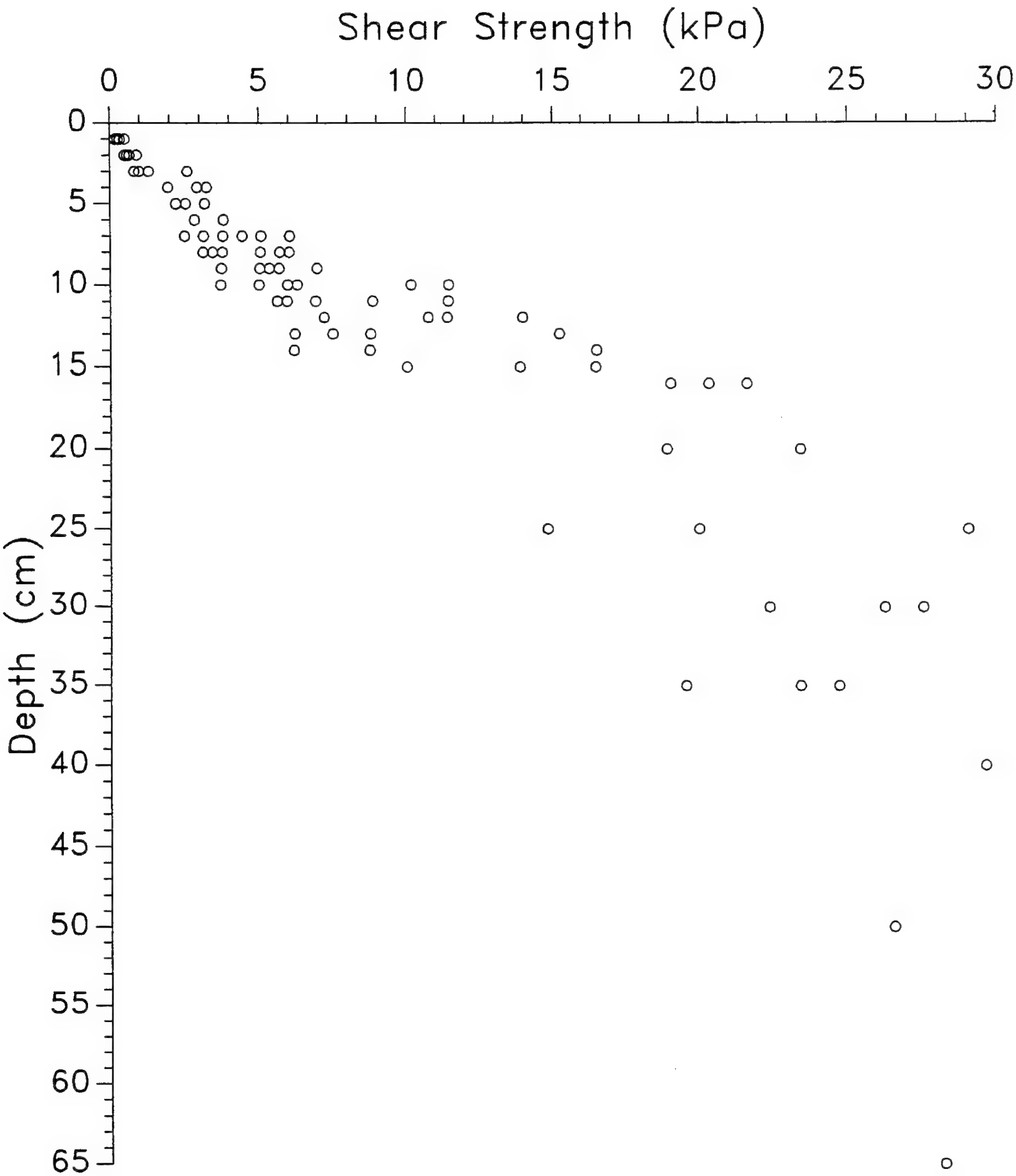
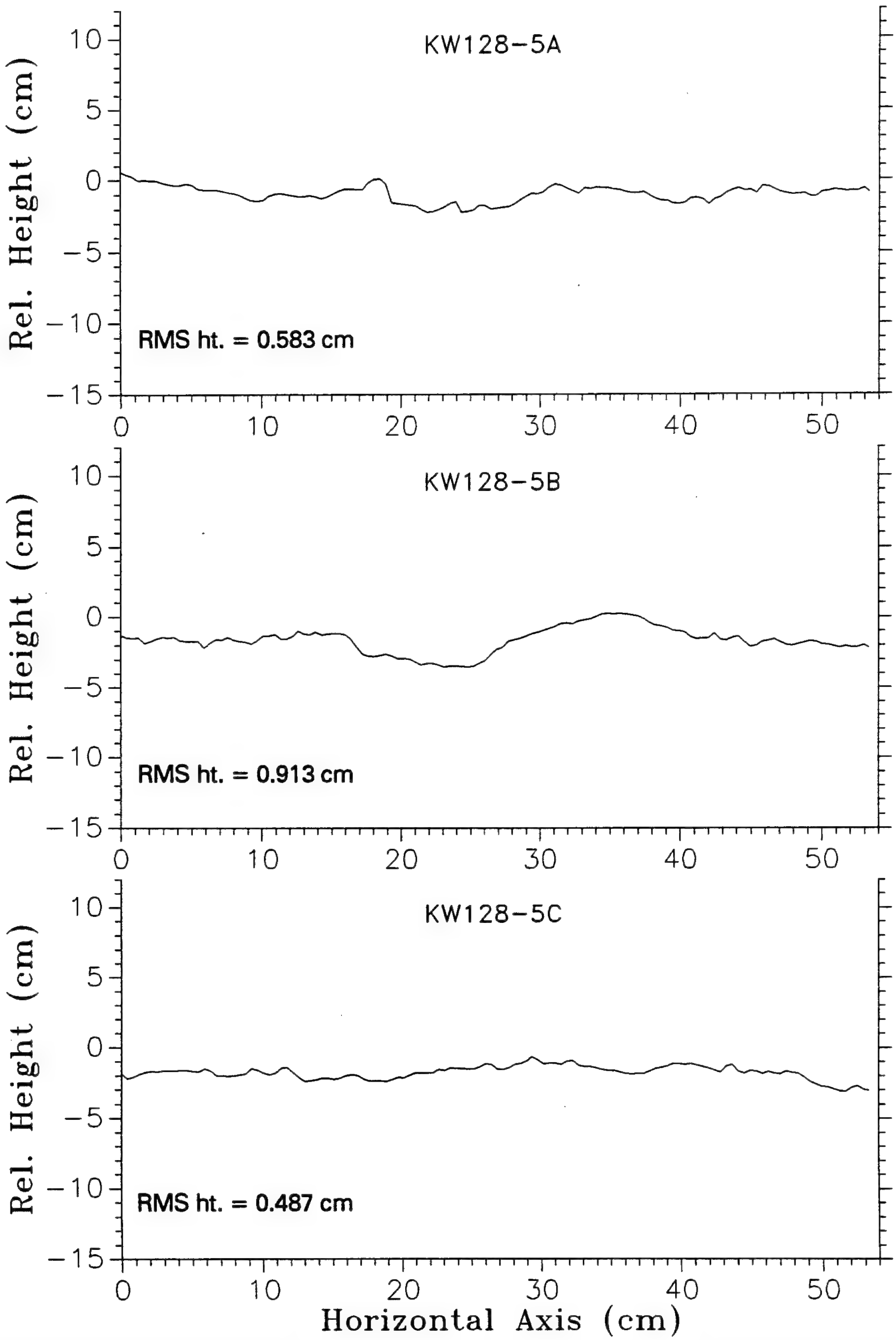
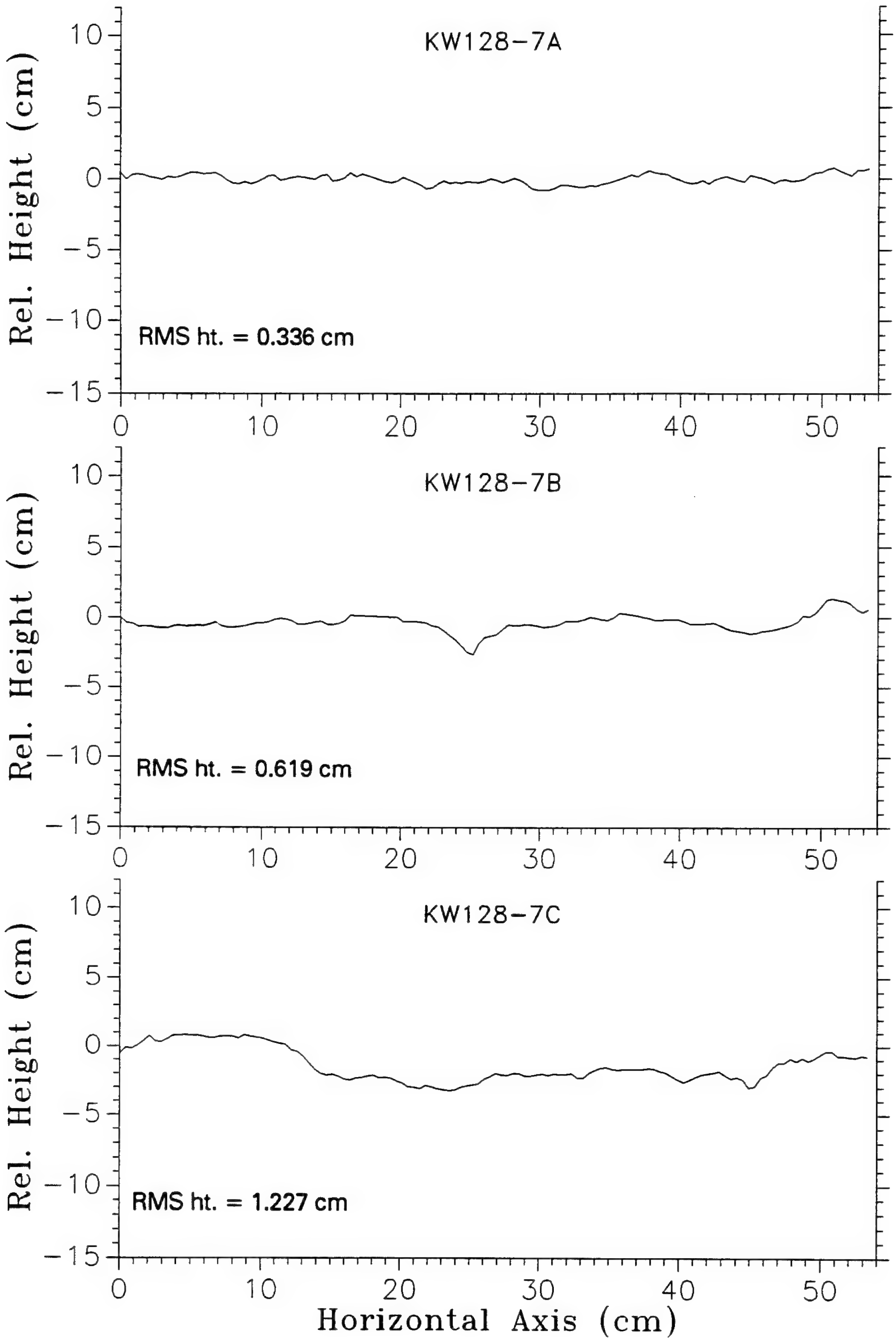


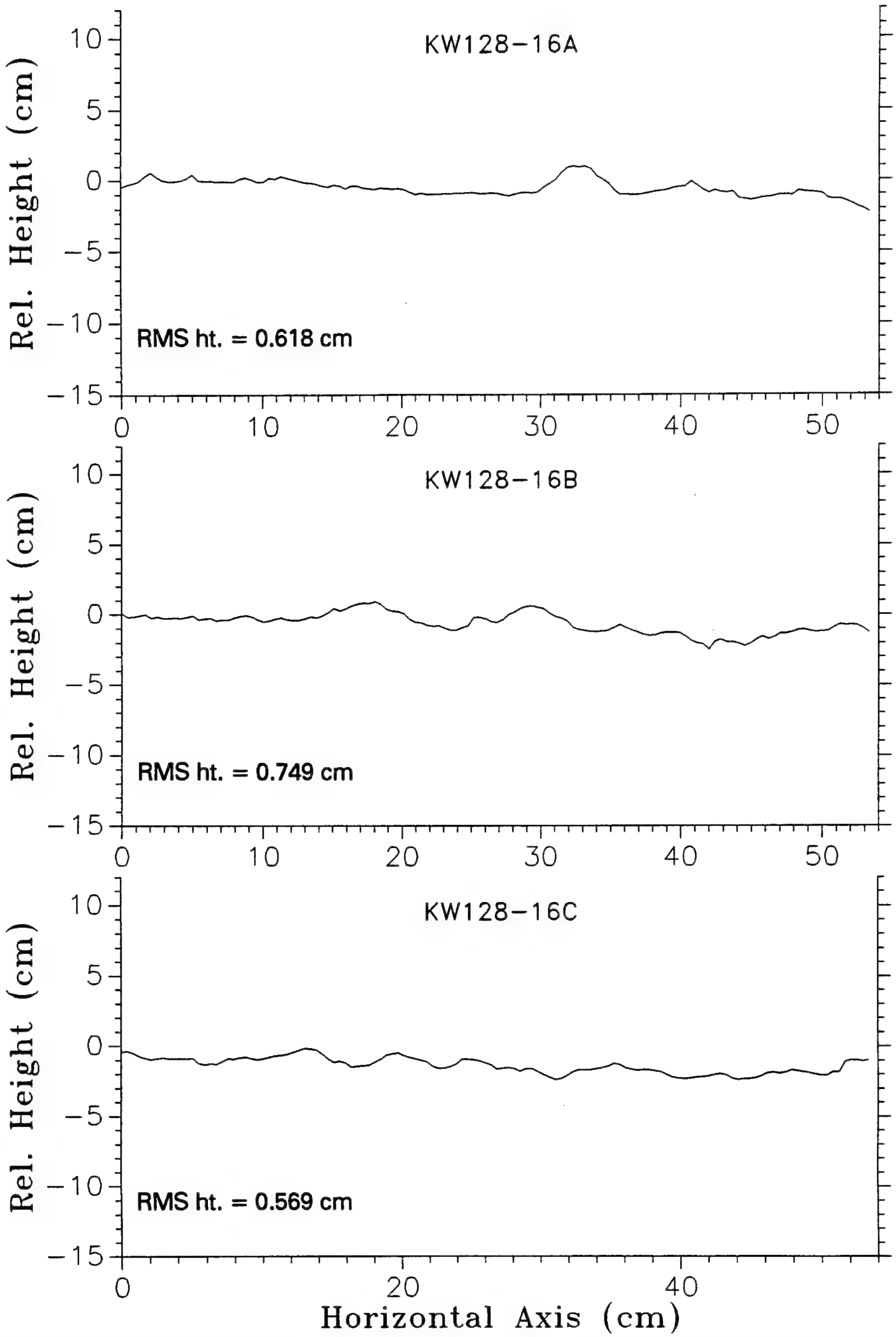
Figure 3.1.8 Depth profile of in-situ sediment shear strength.

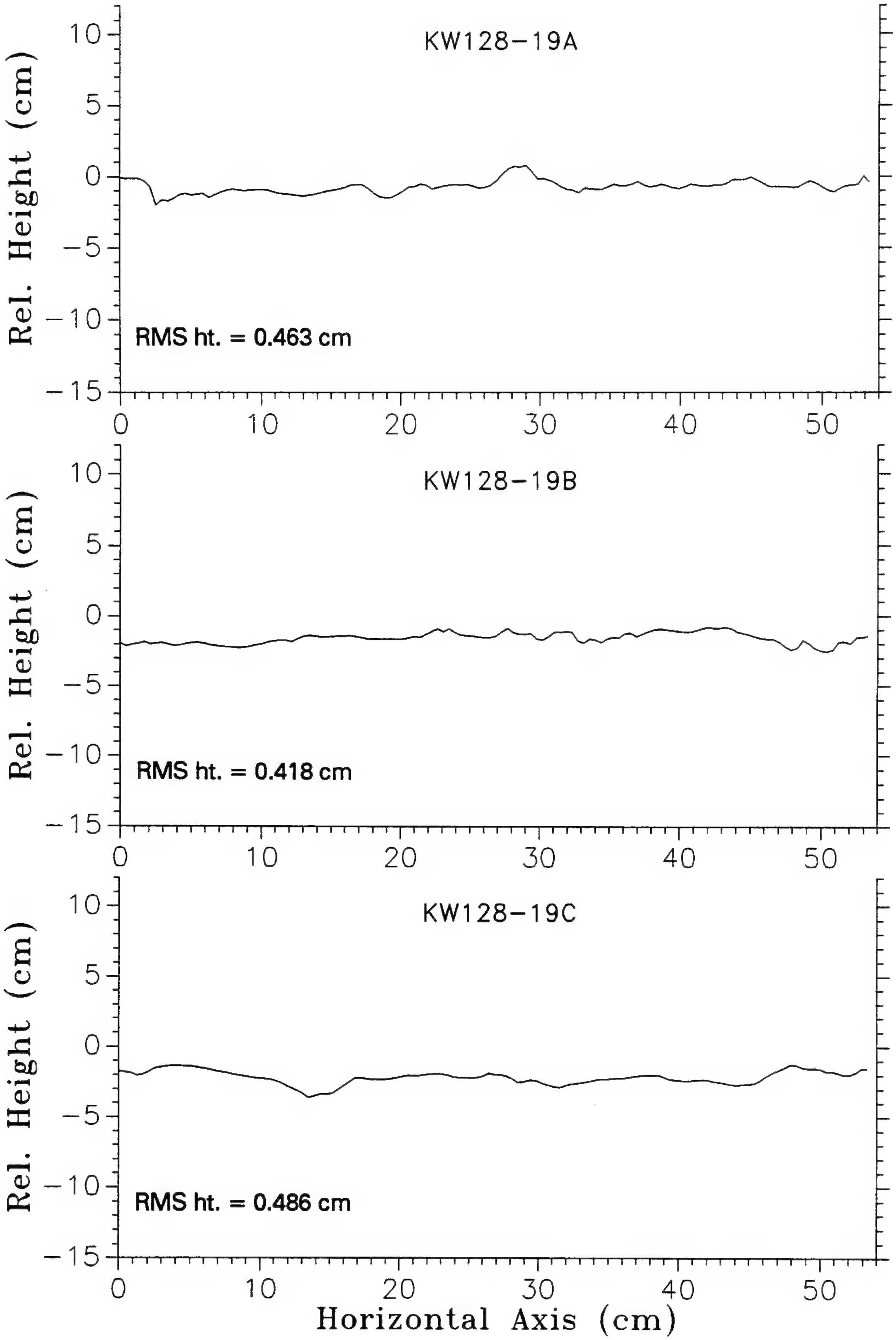
Fig. 3.1.9 Digitized profiles of relative sediment height from stereo photographs:

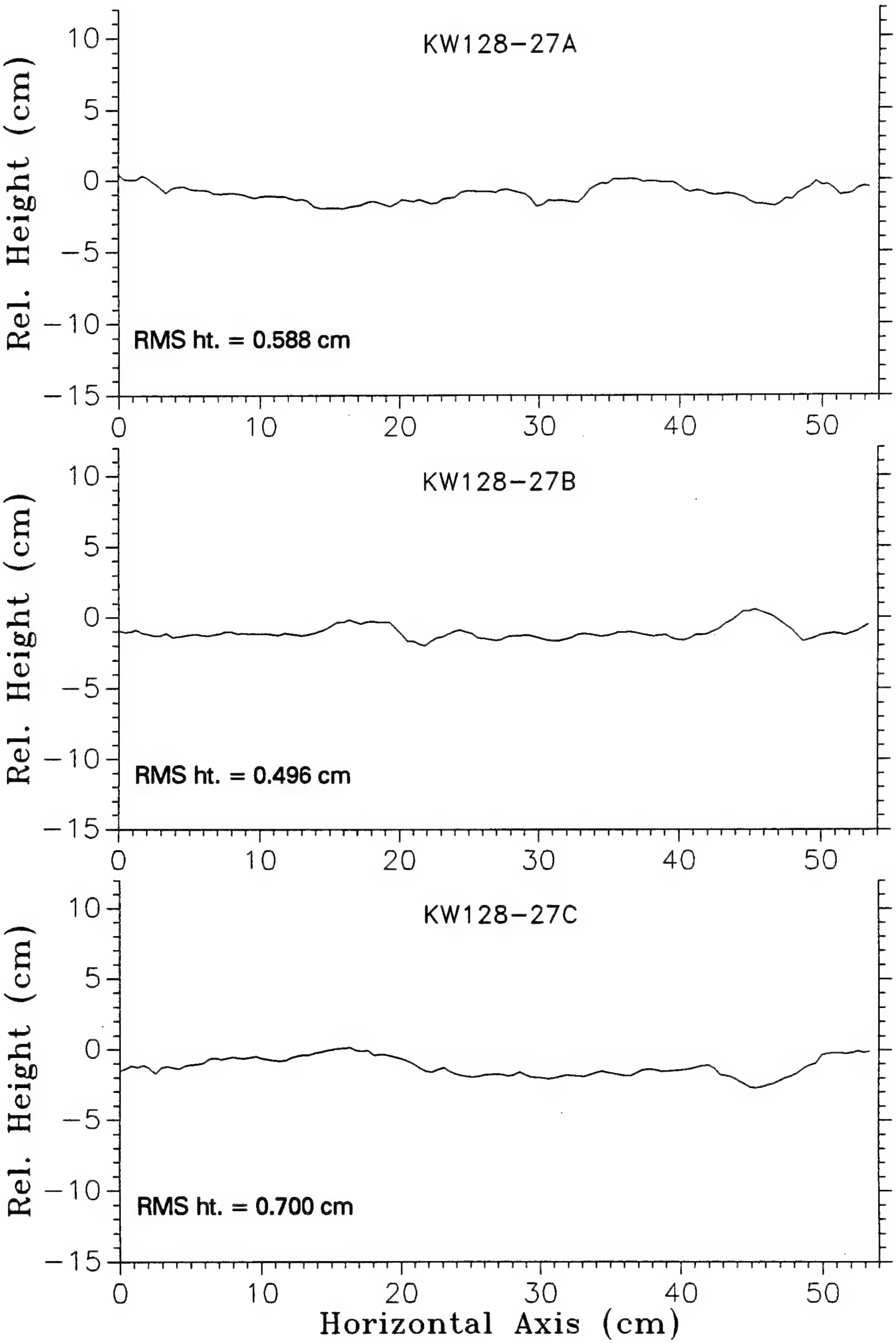
KW-PL-128
5
7
16
19
27
KW-PL-145
2
19
30
33 (diver gouge)
34 (diver gouge)
KW-PL-160
2 (diver smoothed)
4 (diver smoothed)
6 (diver smoothed)
8 (diver smoothed)
10 (diver smoothed)
12 (diver smoothed)
14 (diver smoothed)
16 (diver smoothed)

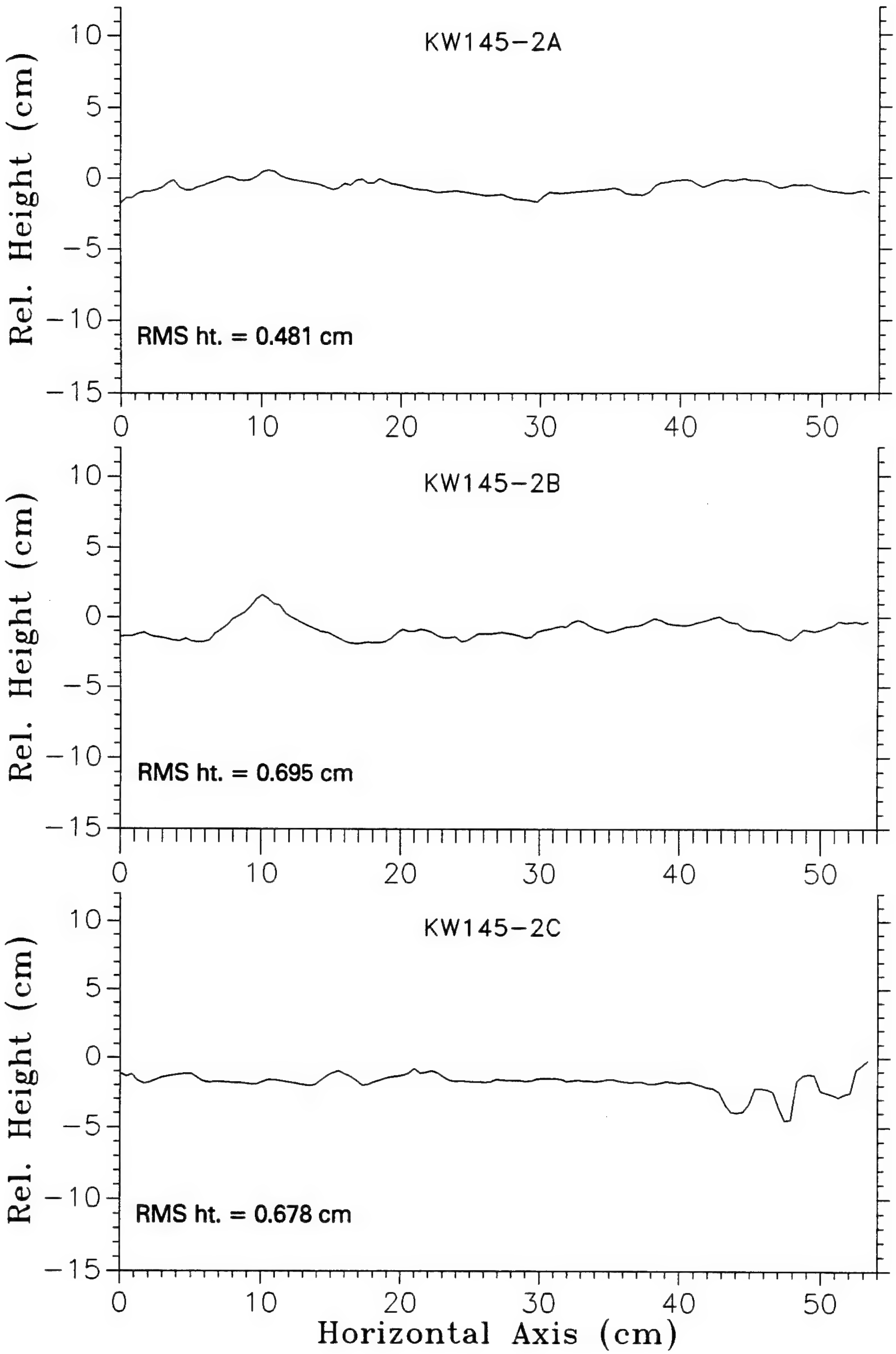

KW128-5A
RMS ht. = 0.583 cm
KW128-5B
RMS ht. = 0.913 cm
KW128-5C
RMS ht. = 0.487 cm
Rel. Height (cm)
Horizontal Axis (cm)
10
5
0
−5
−10
−15
0
10
20
30
40
50

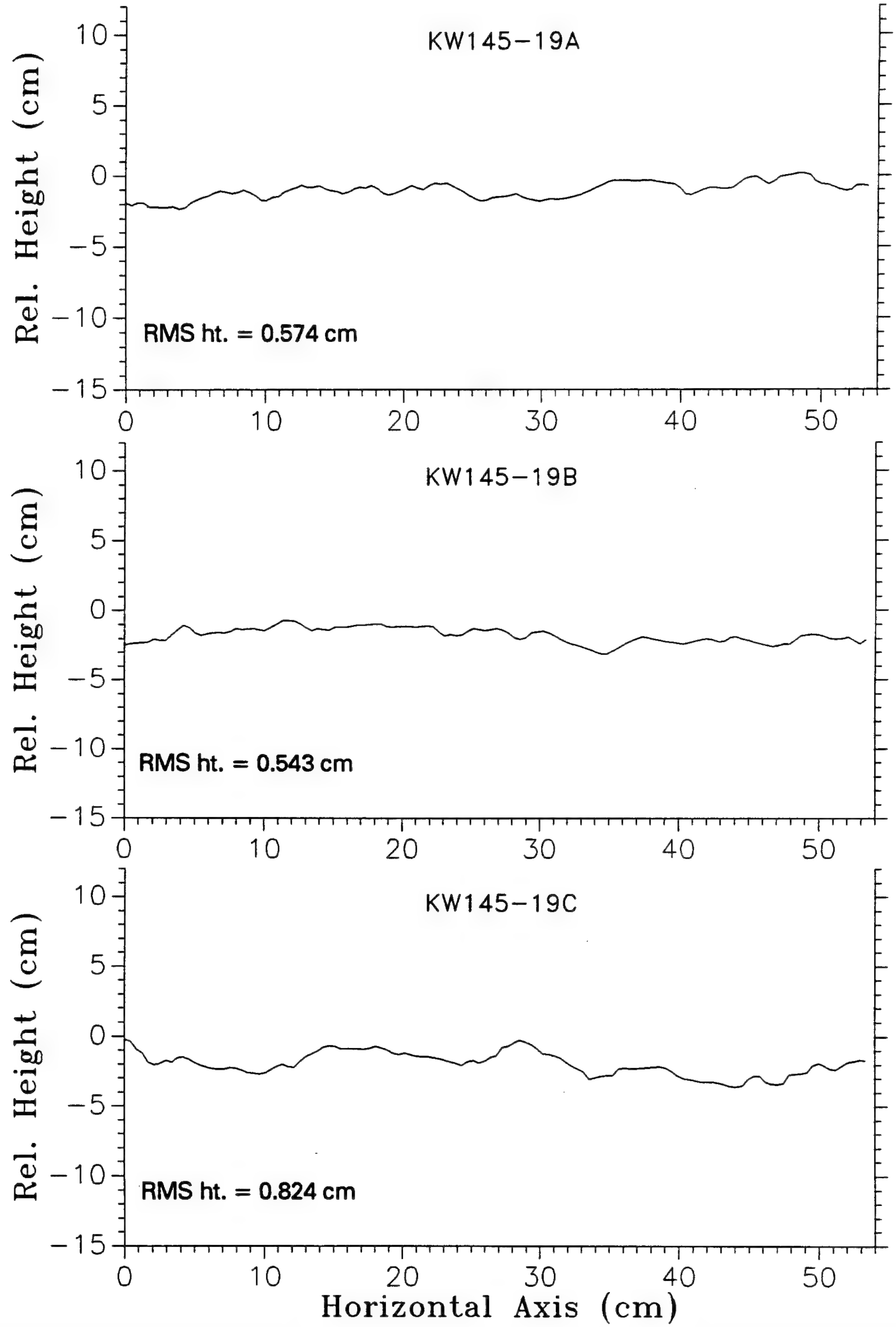

KW128-7A
RMS ht. = 0.336 cm
KW128-7B
RMS ht. = 0.619 cm
KW128-7C
RMS ht. = 1.227 cm
Rel. Height (cm)
Horizontal Axis (cm)
10
5
0
-5
-10
-15
0
10
20
30
40
50

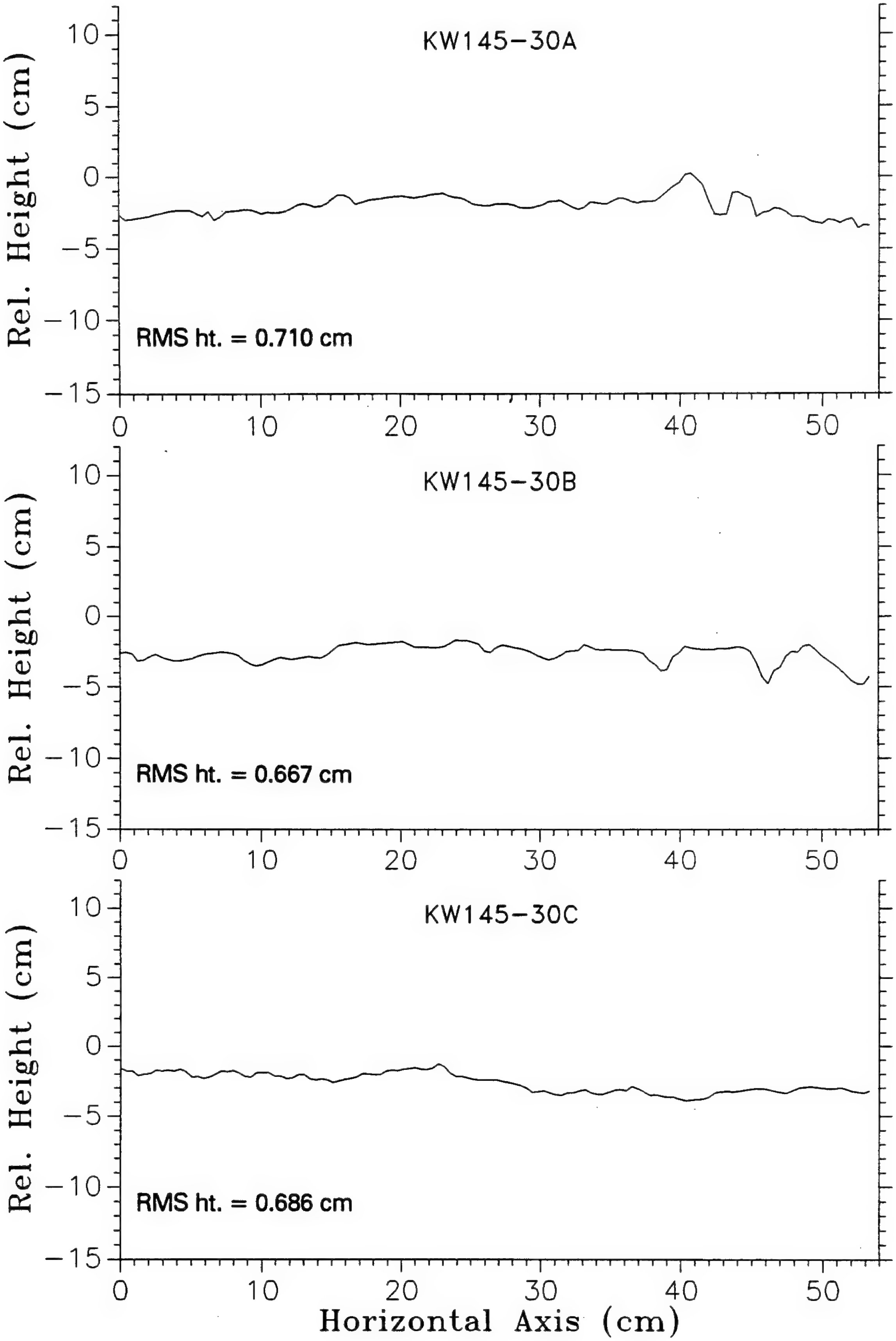

KW128-16A
RMS ht. = 0.618 cm
KW128-16B
RMS ht. = 0.749 cm
KW128-16C
RMS ht. = 0.569 cm
Rel. Height (cm)
Horizontal Axis (cm)
10
5
0
−5
−10
−15
0
10
20
30
40
50

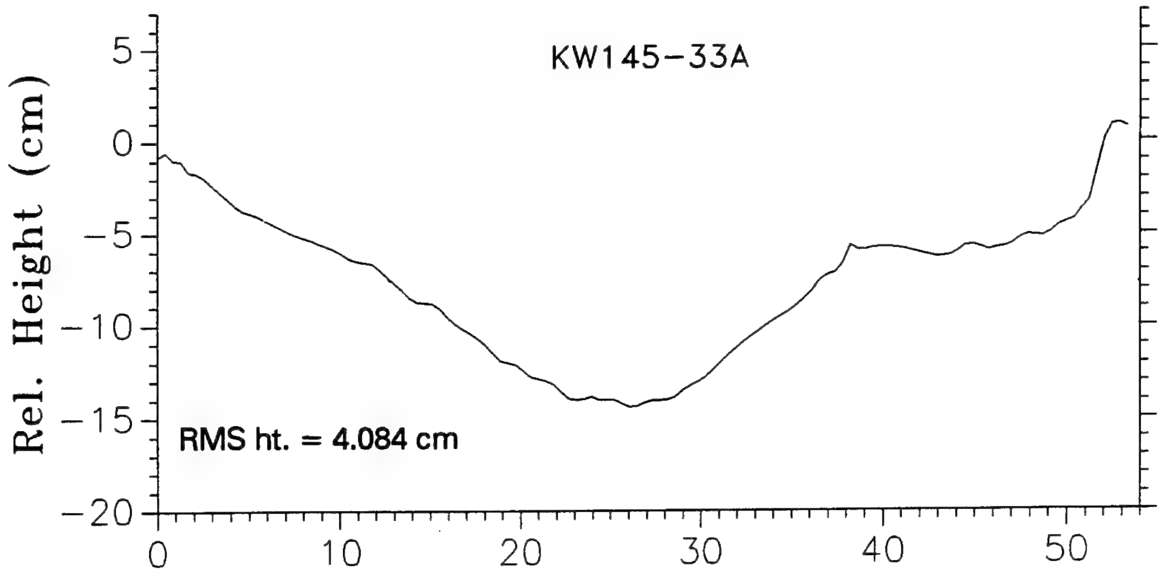

KW128-19A
RMS ht. = 0.463 cm
KW128-19B
RMS ht. = 0.418 cm
KW128-19C
RMS ht. = 0.486 cm
Rel. Height (cm)
Horizontal Axis (cm)

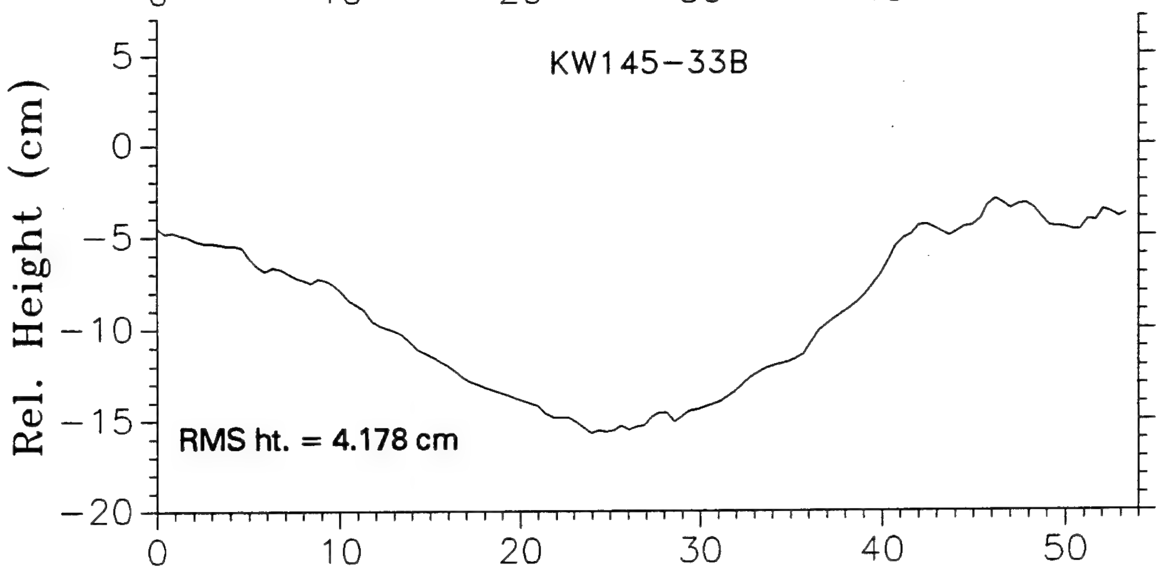

KW128-27A
RMS ht. = 0.588 cm
KW128-27B
RMS ht. = 0.496 cm
KW128-27C
RMS ht. = 0.700 cm
Rel. Height (cm)
Horizontal Axis (cm)
10
5
0
−5
−10
−15
0
10
20
30
40
50

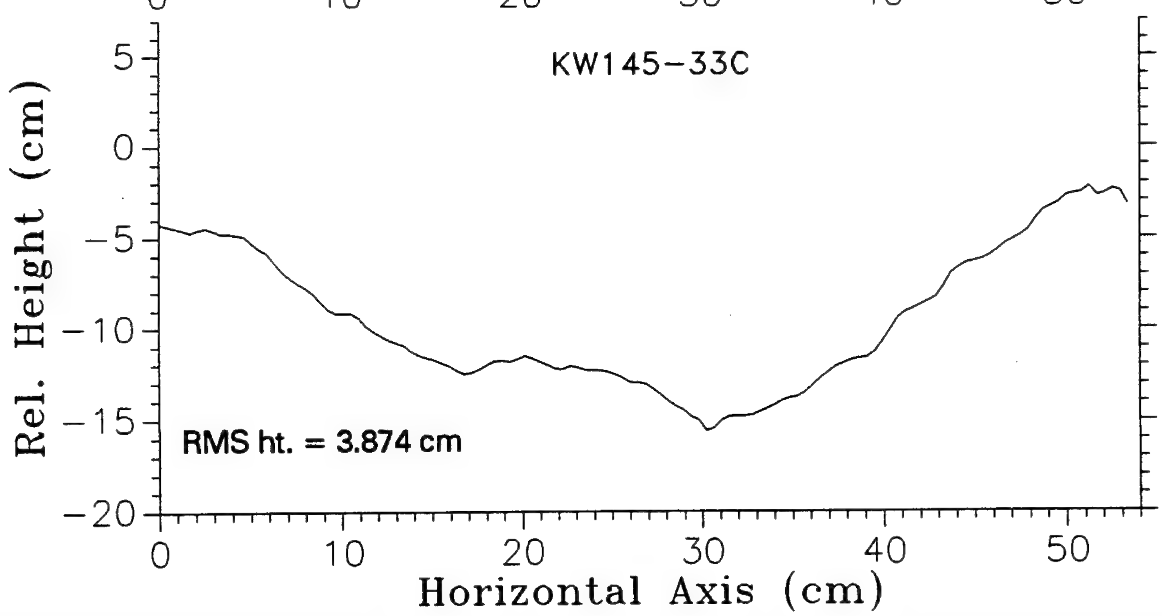

KW145-2A
RMS ht. = 0.481 cm
KW145-2B
RMS ht. = 0.695 cm
KW145-2C
RMS ht. = 0.678 cm
Rel. Height (cm)
Horizontal Axis (cm)
10
5
0
-5
-10
-15
0
10
20
30
40
50

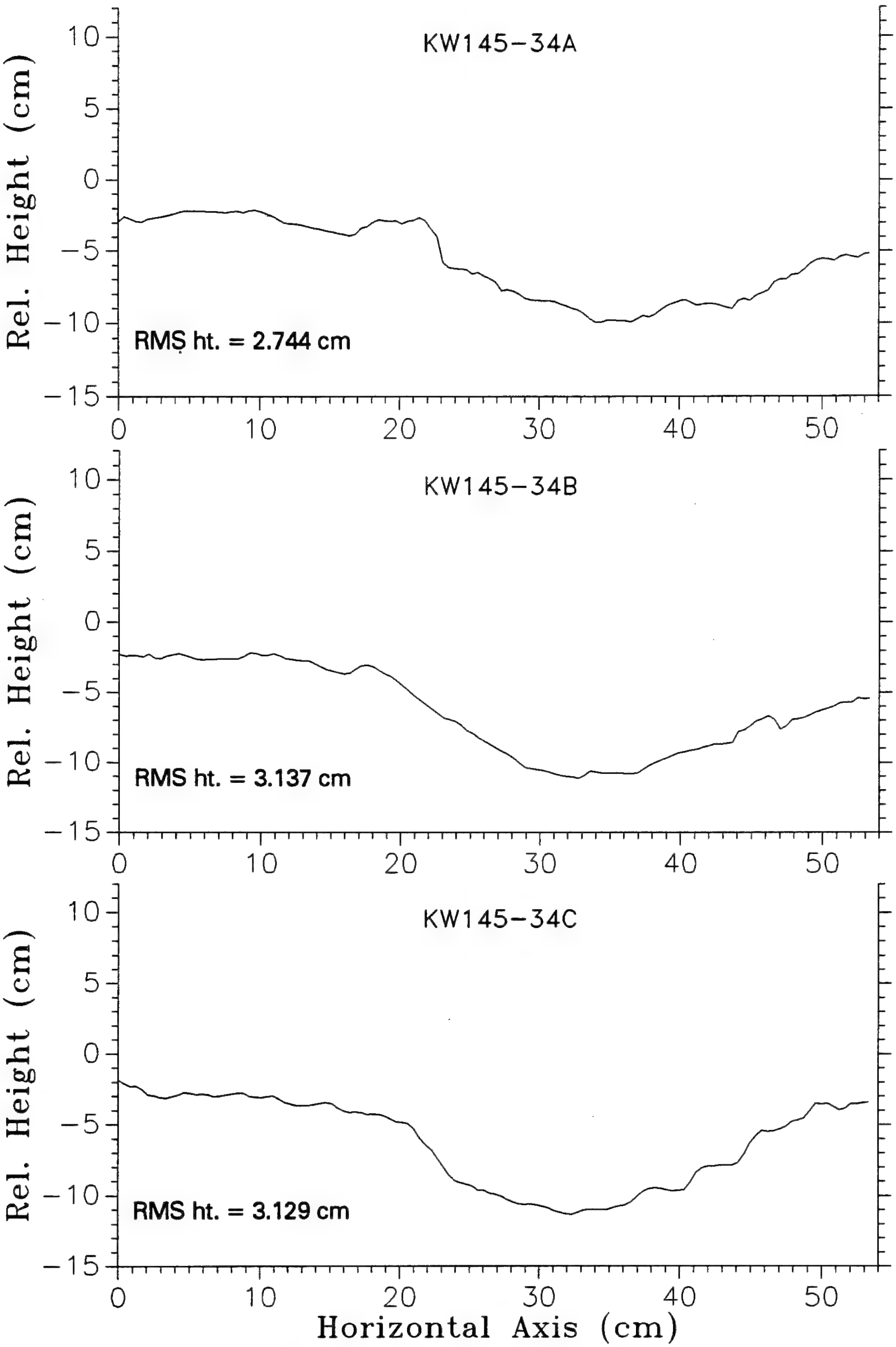

KW145-19A
RMS ht. = 0.574 cm
KW145-19B
RMS ht. = 0.543 cm
KW145-19C
RMS ht. = 0.824 cm
Rel. Height (cm)
Horizontal Axis (cm)
10
5
0
−5
−10
−15
0
10
20
30
40
50

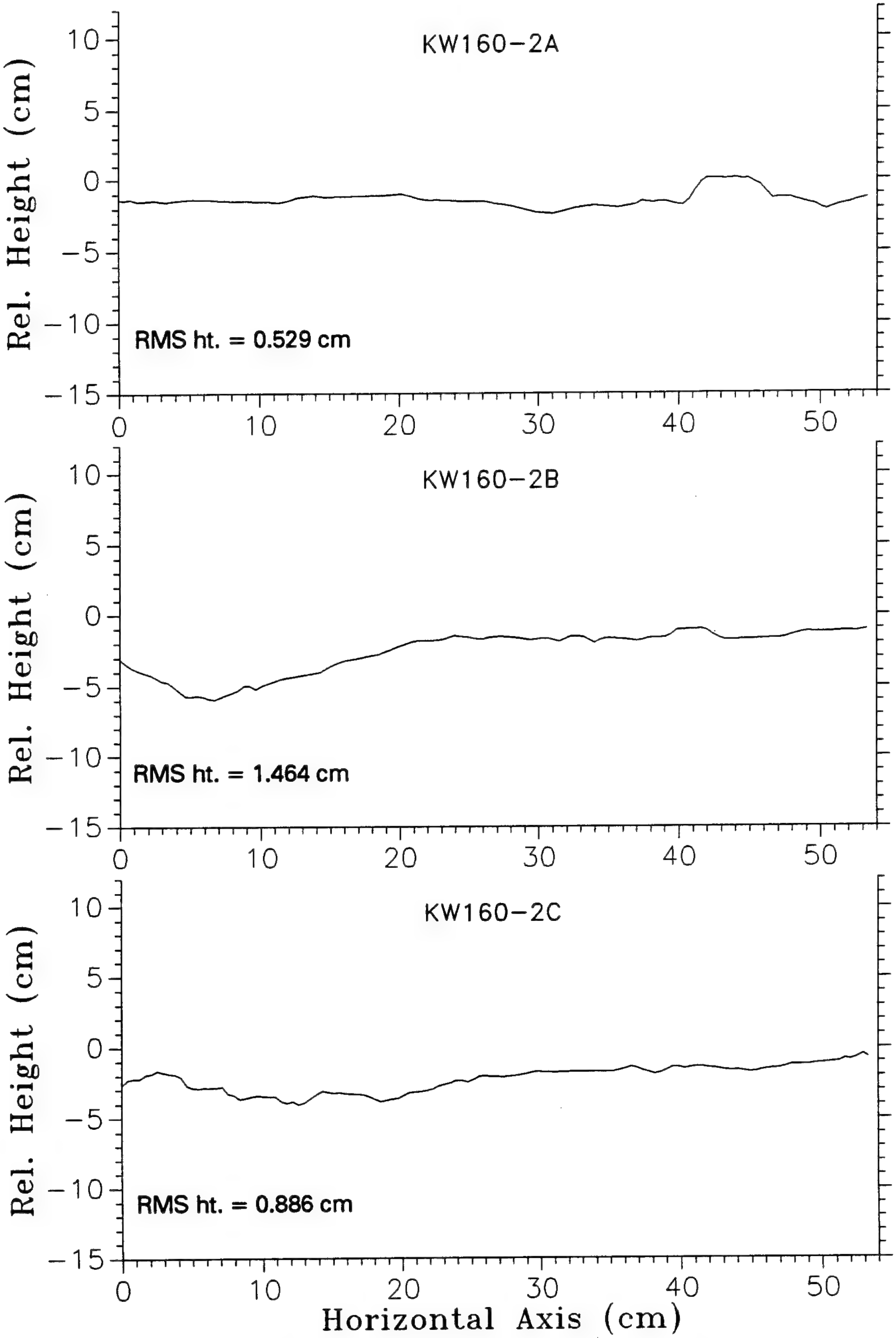

KW145-30A
RMS ht. = 0.710 cm
KW145-30B
RMS ht. = 0.667 cm
KW145-30C
RMS ht. = 0.686 cm
Rel. Height (cm)
Horizontal Axis (cm)
10
5
0
−5
−10
−15
0
10
20
30
40
50

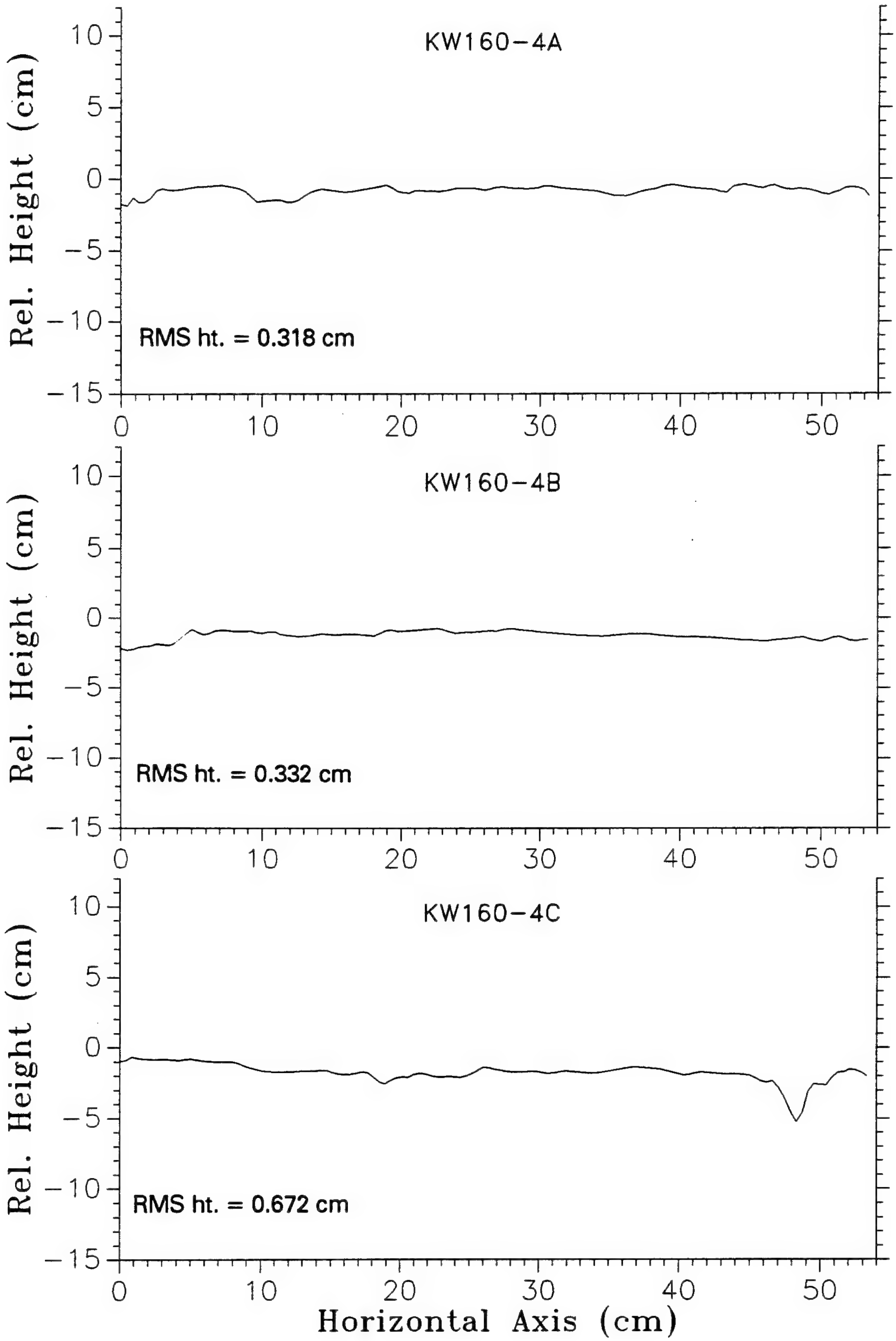

KW145−33A
RMS ht. = 4.084 cm
Rel. Height (cm)
5
0
−5
−10
−15
−20
0
10
20
30
40
50

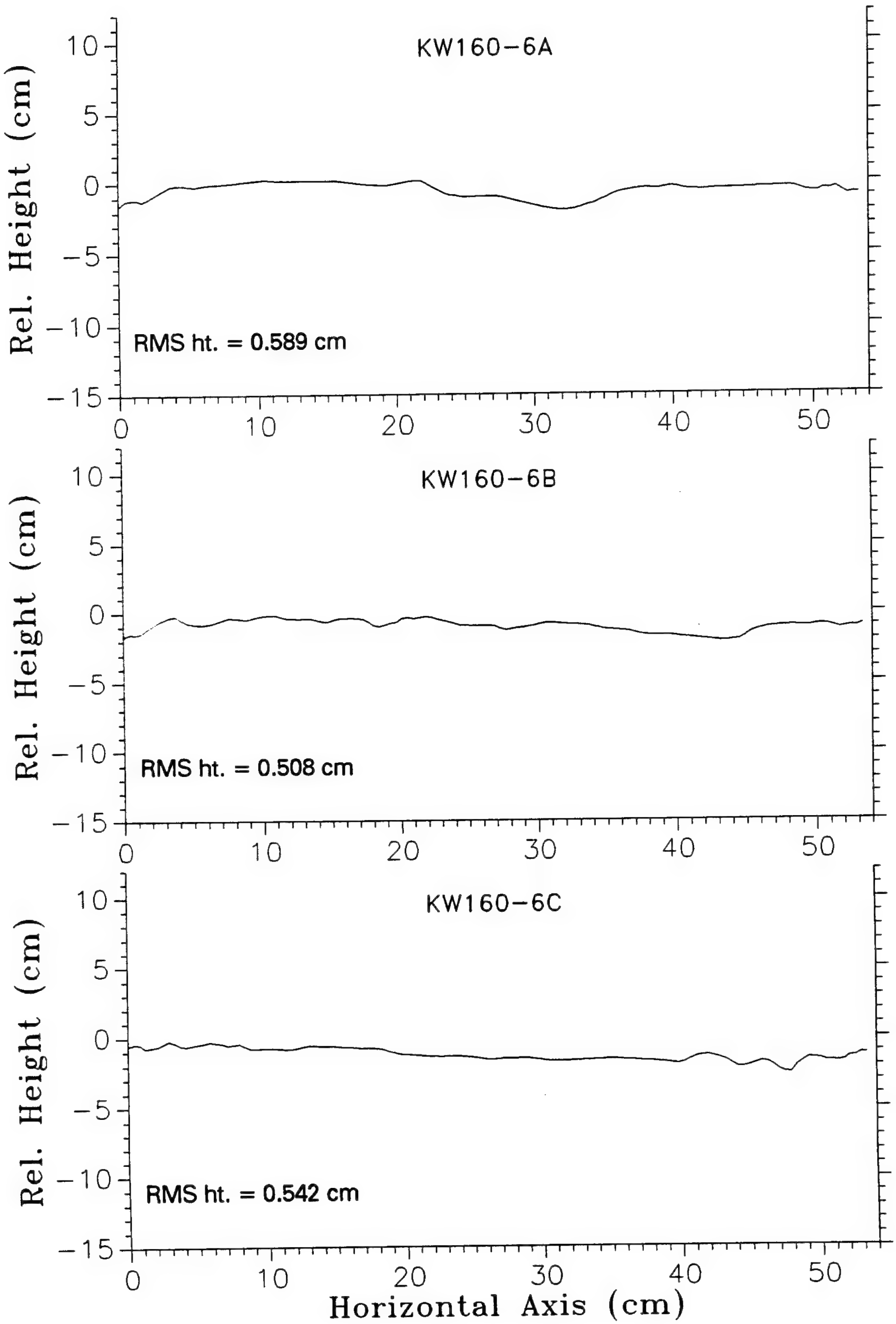

KW145−33B
RMS ht. = 4.178 cm
Rel. Height (cm)
5
0
−5
−10
−15
−20
0
10
20
30
40
50

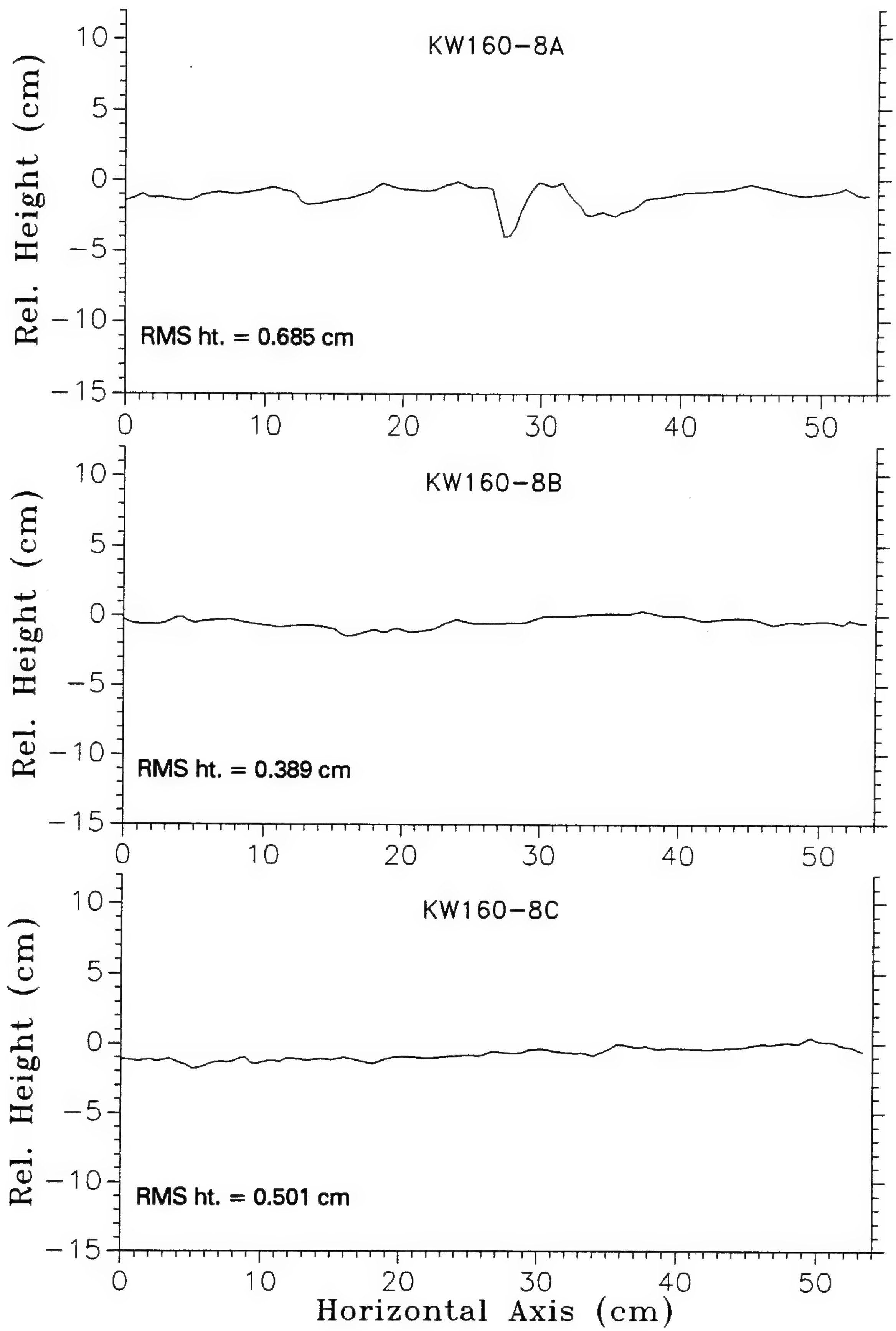

KW145−33C
RMS ht. = 3.874 cm
Rel. Height (cm)
5
0
−5
−10
−15
−20
0
10
20
30
40
50
Horizontal Axis (cm)

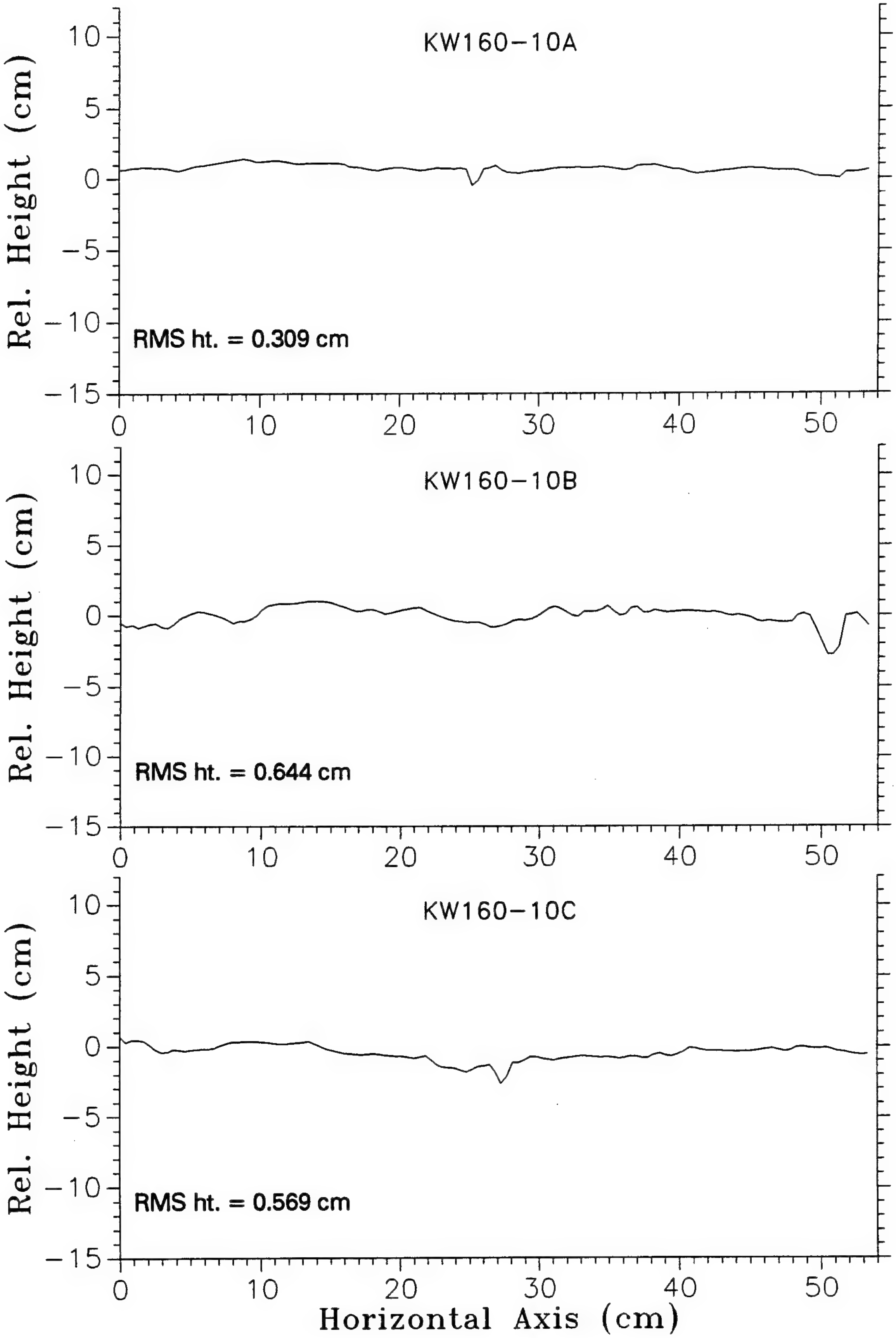

KW145-34A
RMS ht. = 2.744 cm
KW145-34B
RMS ht. = 3.137 cm
KW145-34C
RMS ht. = 3.129 cm
Rel. Height (cm)
Horizontal Axis (cm)
10
5
0
-5
-10
-15
0
10
20
30
40
50


KW160-2A
RMS ht. = 0.529 cm
KW160-2B
RMS ht. = 1.464 cm
KW160-2C
RMS ht. = 0.886 cm
Rel. Height (cm)
Horizontal Axis (cm)

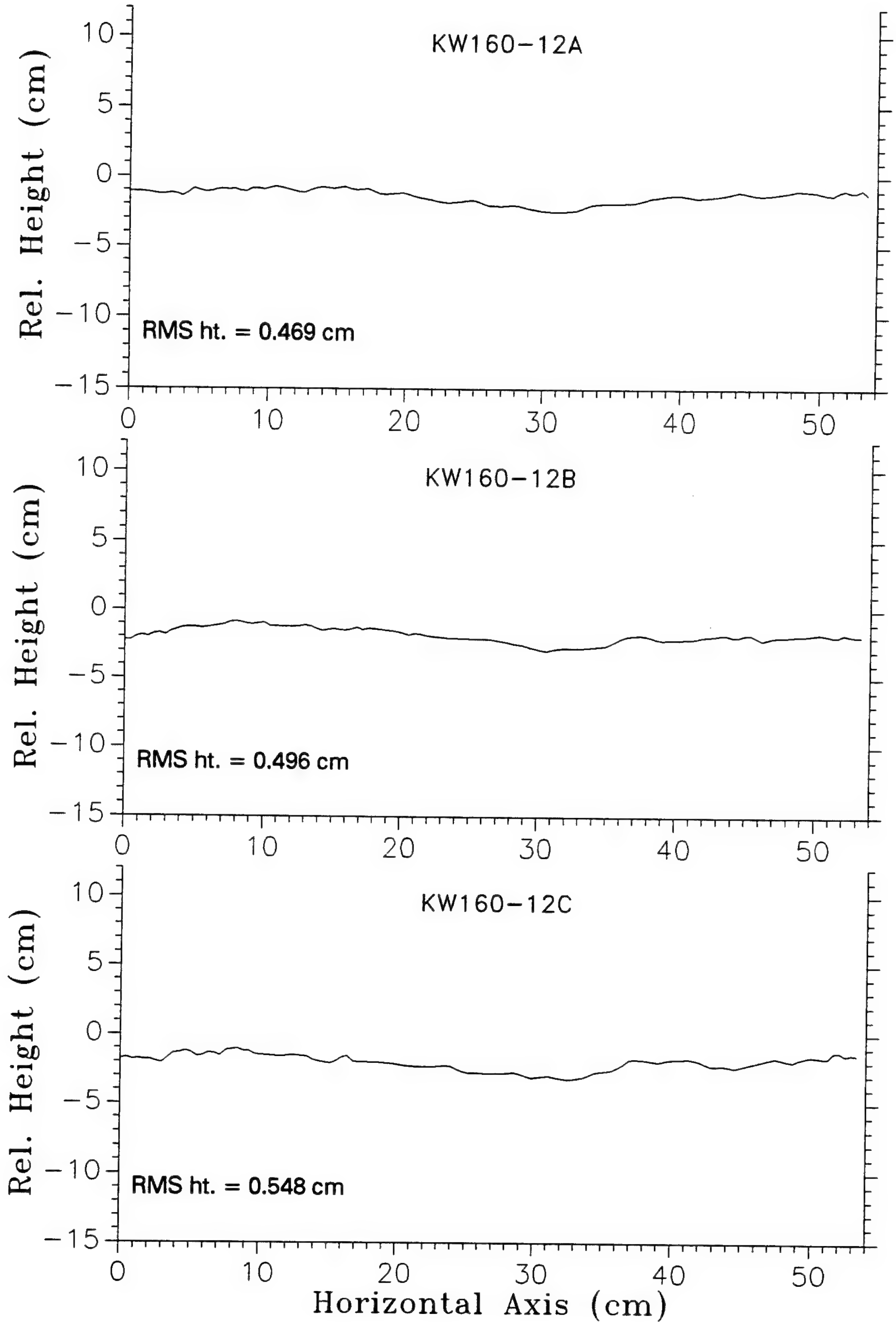

KW160-4A
RMS ht. = 0.318 cm
KW160-4B
RMS ht. = 0.332 cm
KW160-4C
RMS ht. = 0.672 cm
Rel. Height (cm)
Horizontal Axis (cm)
10
5
0
-5
-10
-15
0
10
20
30
40
50

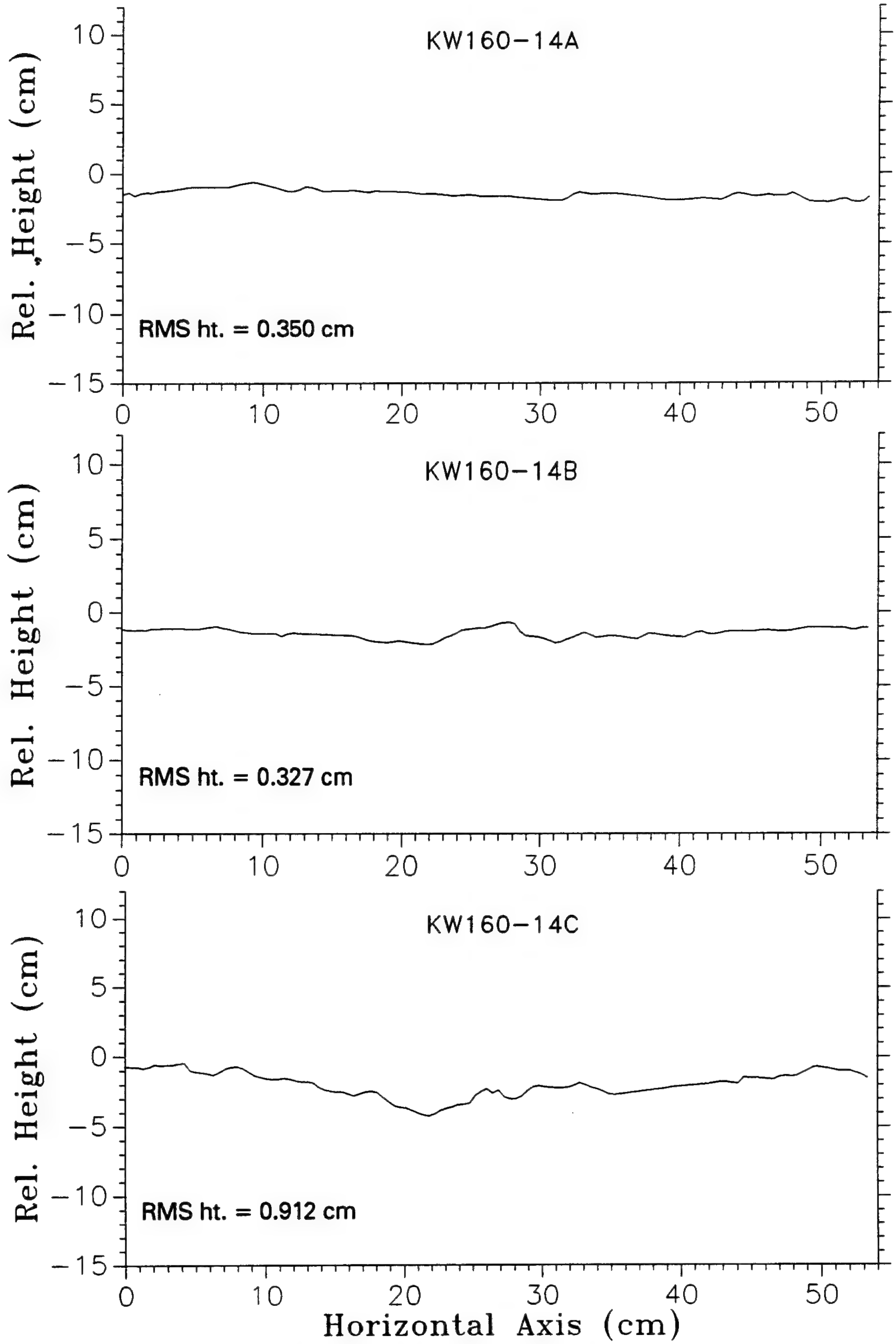

KW160−6A
RMS ht. = 0.589 cm
KW160−6B
RMS ht. = 0.508 cm
KW160−6C
RMS ht. = 0.542 cm
Rel. Height (cm)
Horizontal Axis (cm)
10
5
0
−5
−10
−15
0
10
20
30
40
50


KW160-8A
RMS ht. = 0.685 cm
KW160-8B
RMS ht. = 0.389 cm
KW160-8C
RMS ht. = 0.501 cm
Rel. Height (cm)
Horizontal Axis (cm)
10
5
0
−5
−10
−15
0
10
20
30
40
50



KW160−10A
RMS ht. = 0.309 cm
KW160−10B
RMS ht. = 0.644 cm
KW160−10C
RMS ht. = 0.569 cm
Rel. Height (cm)
Horizontal Axis (cm)


KW160−12A
RMS ht. = 0.469 cm
KW160−12B
RMS ht. = 0.496 cm
KW160−12C
RMS ht. = 0.548 cm
Rel. Height (cm)
Horizontal Axis (cm)
10
5
0
−5
−10
−15
0
10
20
30
40
50


KW160-14A
RMS ht. = 0.350 cm
KW160-14B
RMS ht. = 0.327 cm
KW160-14C
RMS ht. = 0.912 cm
Rel. Height (cm)
Horizontal Axis (cm)
10
5
0
−5
−10
−15
0
10
20
30
40
50

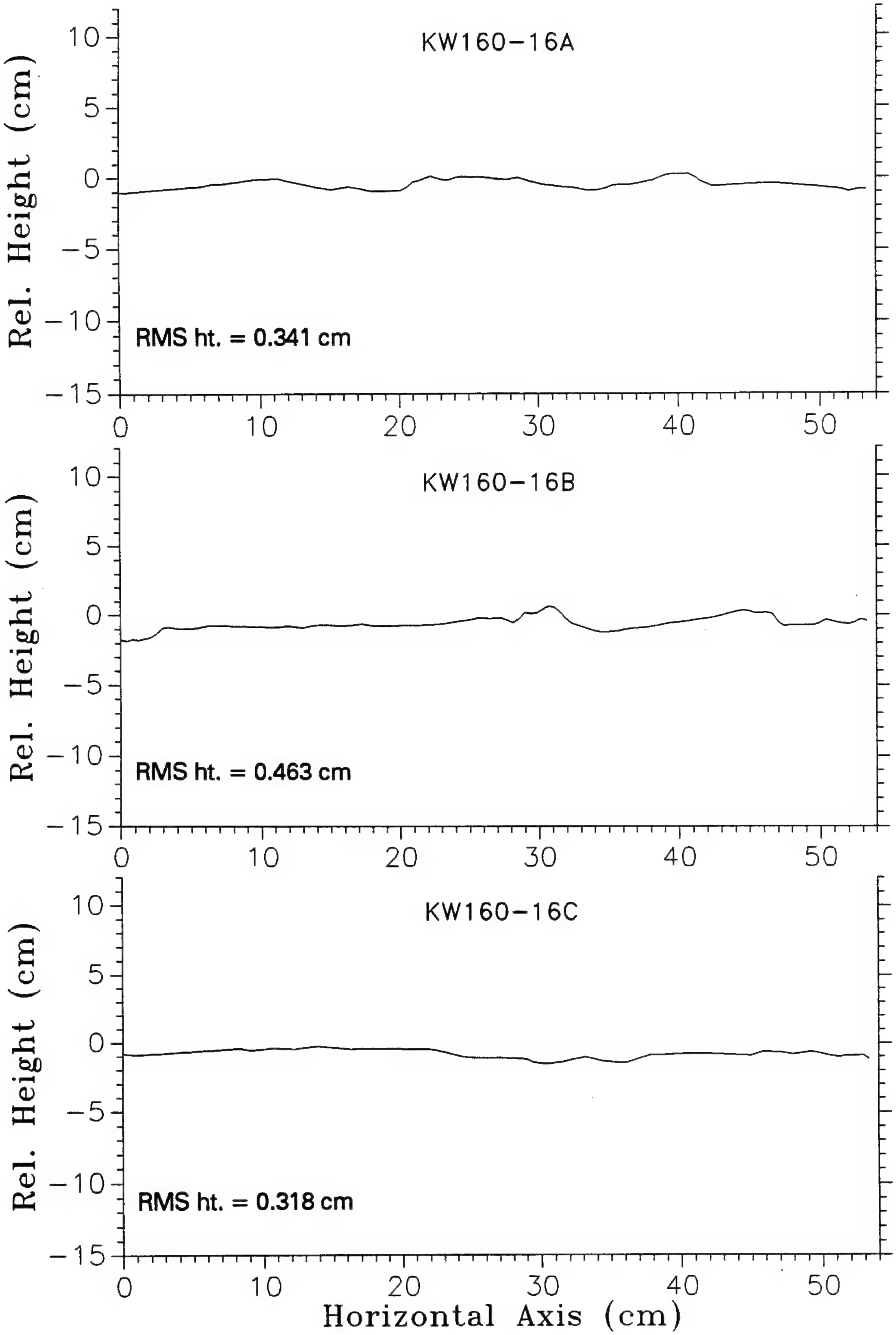
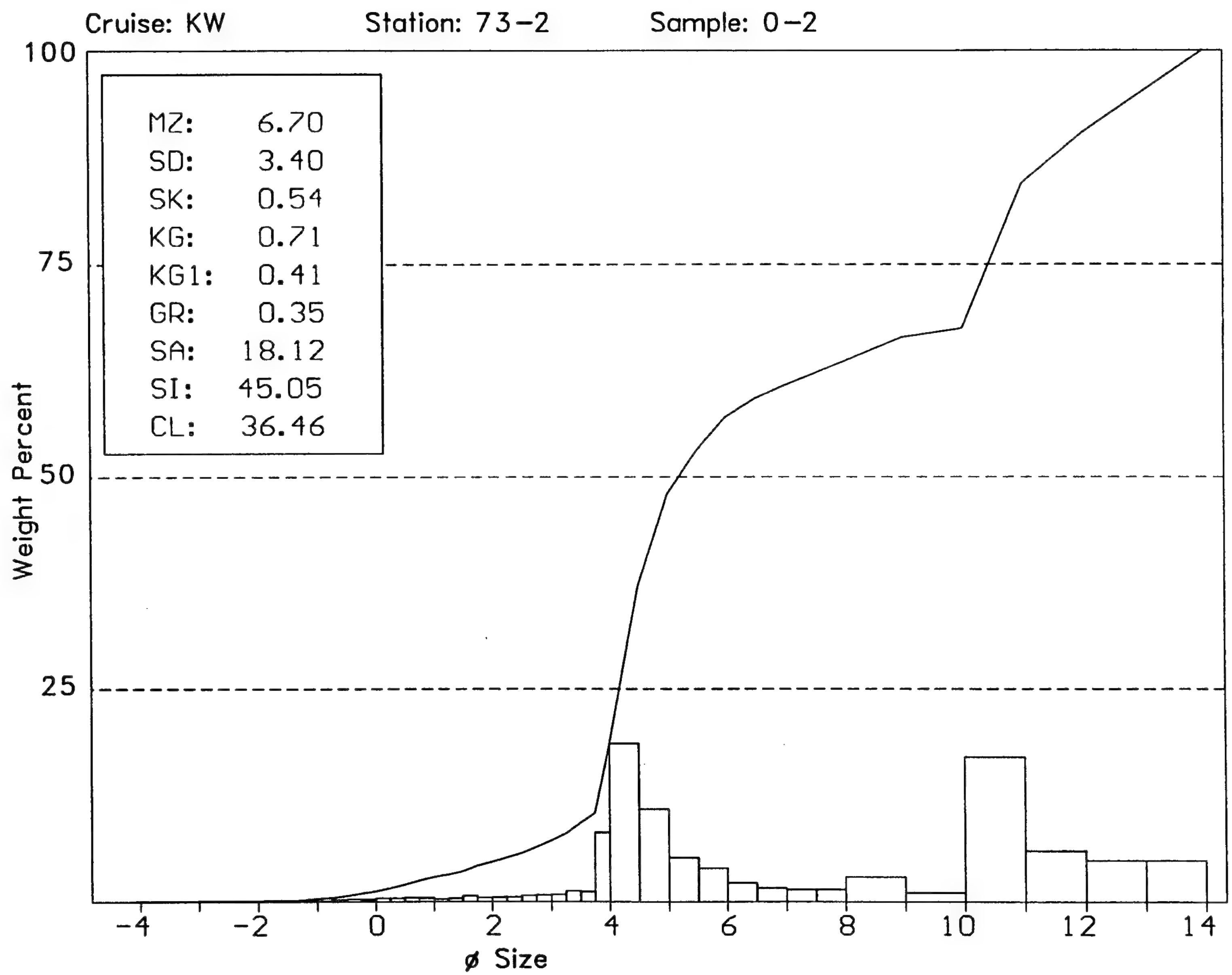
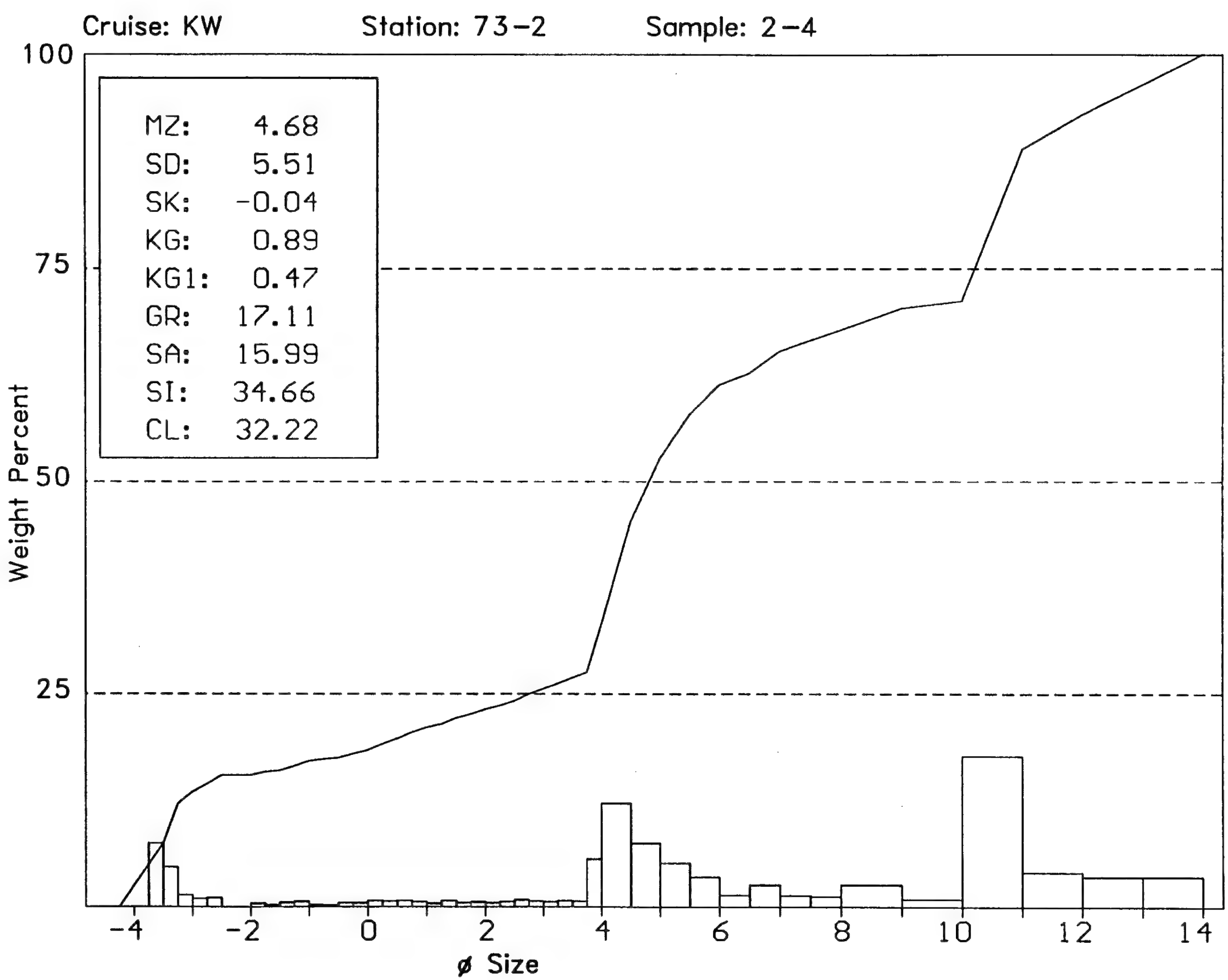

KW160-16A
RMS ht. = 0.341 cm
KW160-16B
RMS ht. = 0.463 cm
KW160-16C
RMS ht. = 0.318 cm
Rel. Height (cm)
Horizontal Axis (cm)
10
5
0
-5
-10
-15
0
10
20
30
40
50

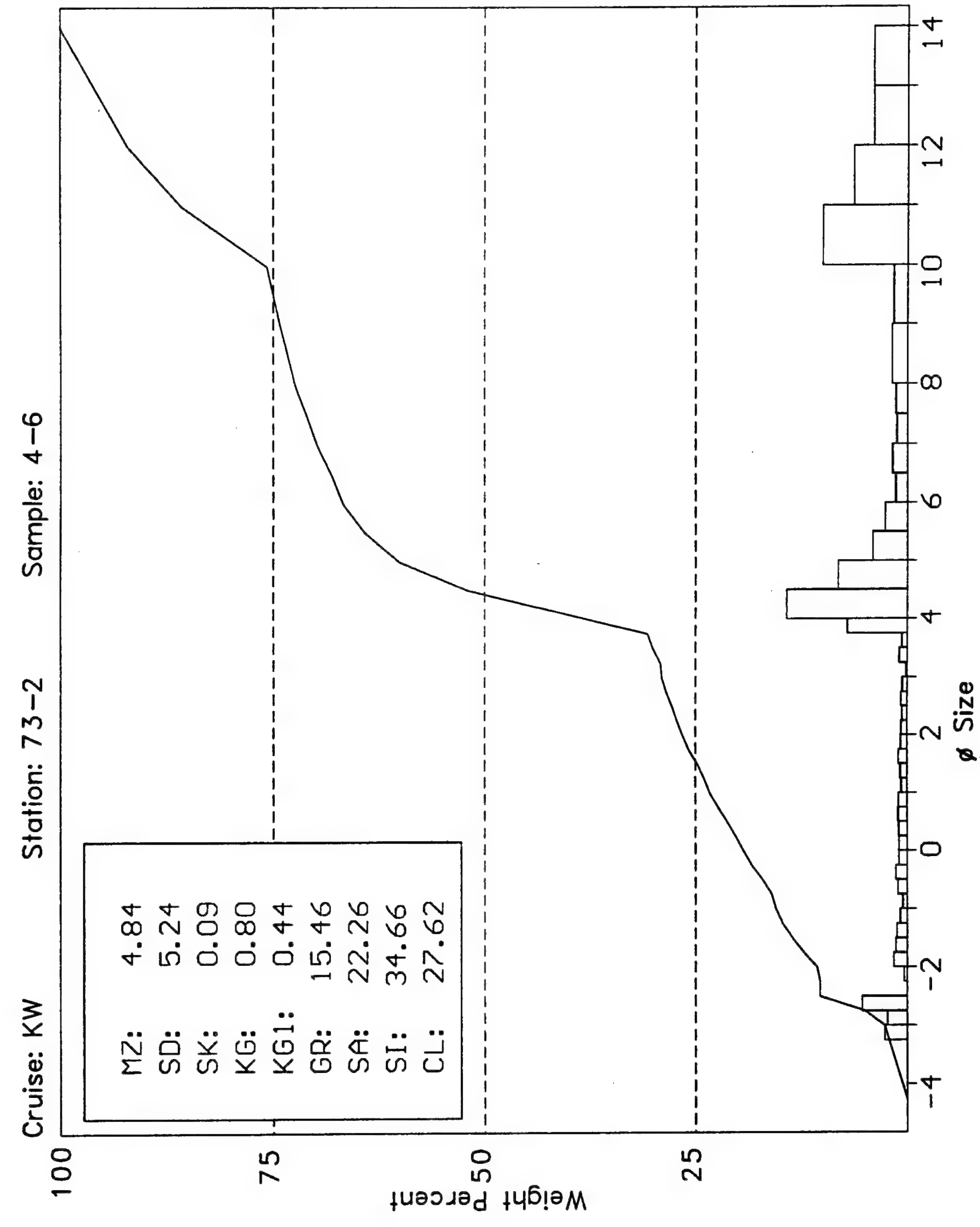
Fig. 3.1.10 Sediment grain size distribution histograms for the following cores:

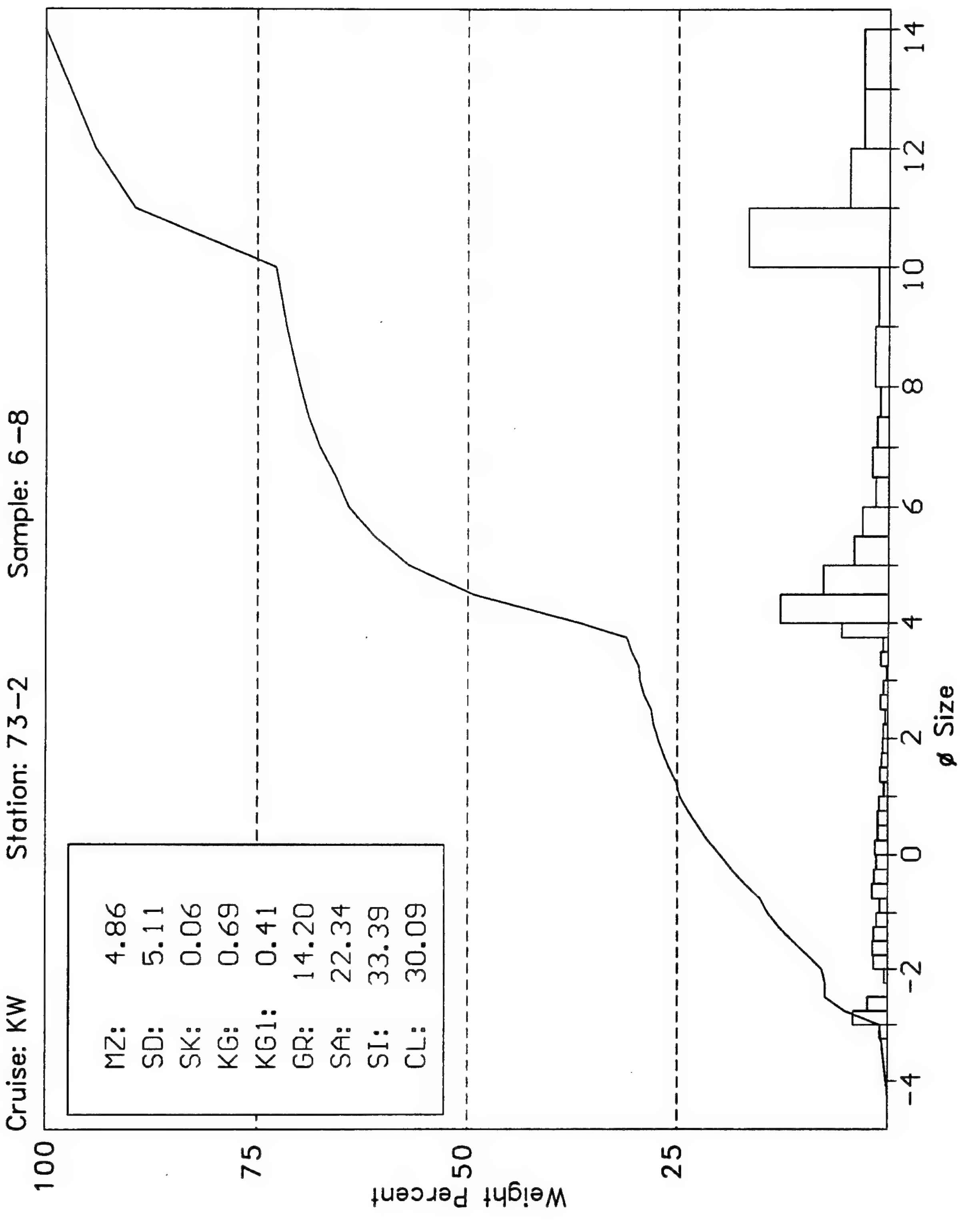
KW-73-2
KW-88-1
KW-93
KW-123-1
KW-127
KW-PL-113-2
KW-PL-173-1
KW-PL-192-2
KW-PL-198-1
KW-PL-208
KW-PL-215
KW-PL-219
KW-PL-221
KW-PL-223
KW-PL-244-1
KW-PL-244-2
KW-PL-263
KW-PL-249 (grab)
KW-PL-252 (grab)
KW-PL-254 (grab)
KW-PL-258 (grab)
KW-PL-267 (grab)
KW-PL-275 (grab)
KW-PL-285 (grab)
KW-PL-287 (grab)

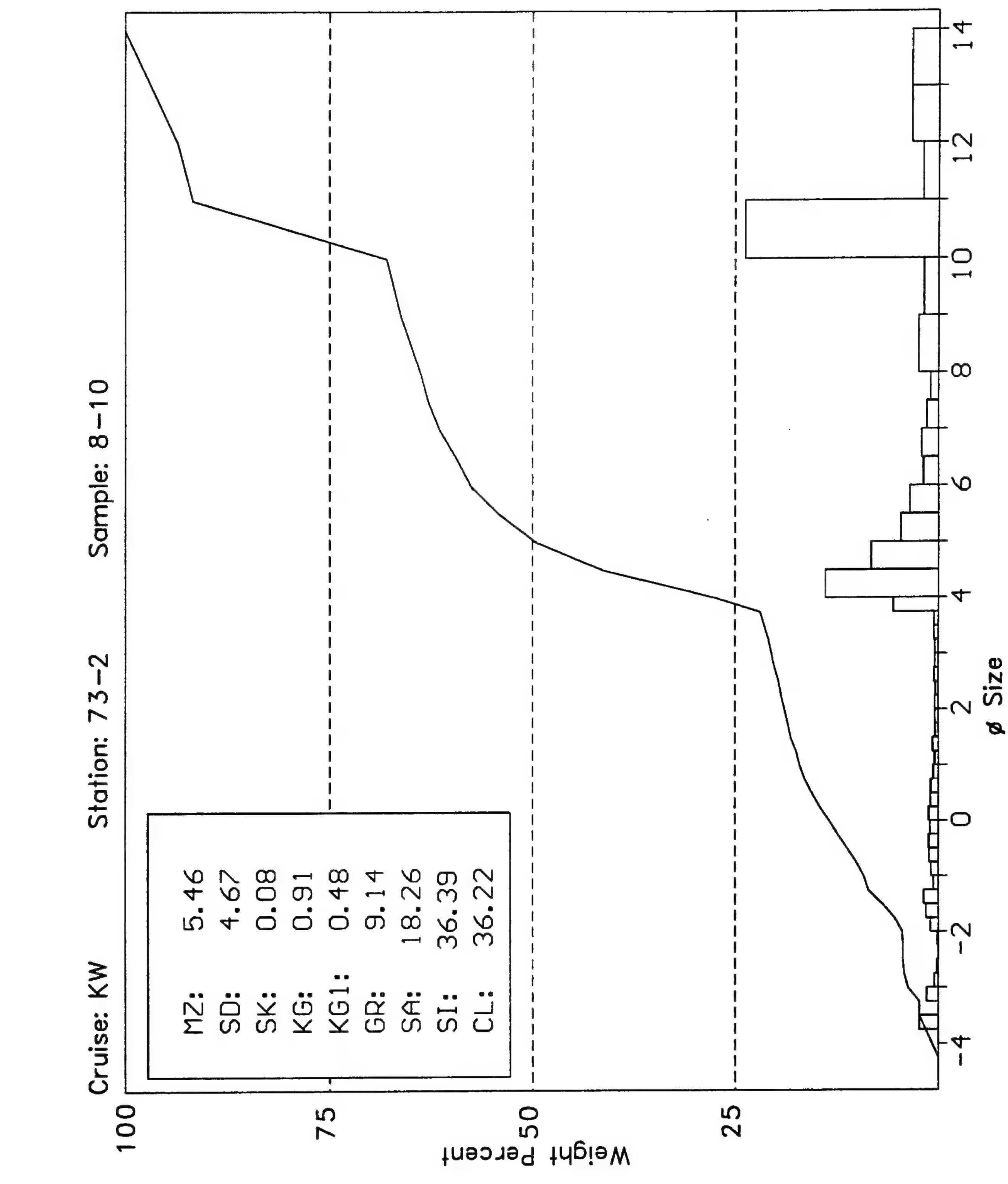

Cruise: KW
Station: 73−2
Sample: 0−2
MZ: 6.70
SD: 3.40
SK: 0.54
KG: 0.71
KG1: 0.41
GR: 0.35
SA: 18.12
SI: 45.05
CL: 36.46
100
75
50
25
Weight Percent
−4
−2
0
2
4
6
8
10
12
14
ø Size



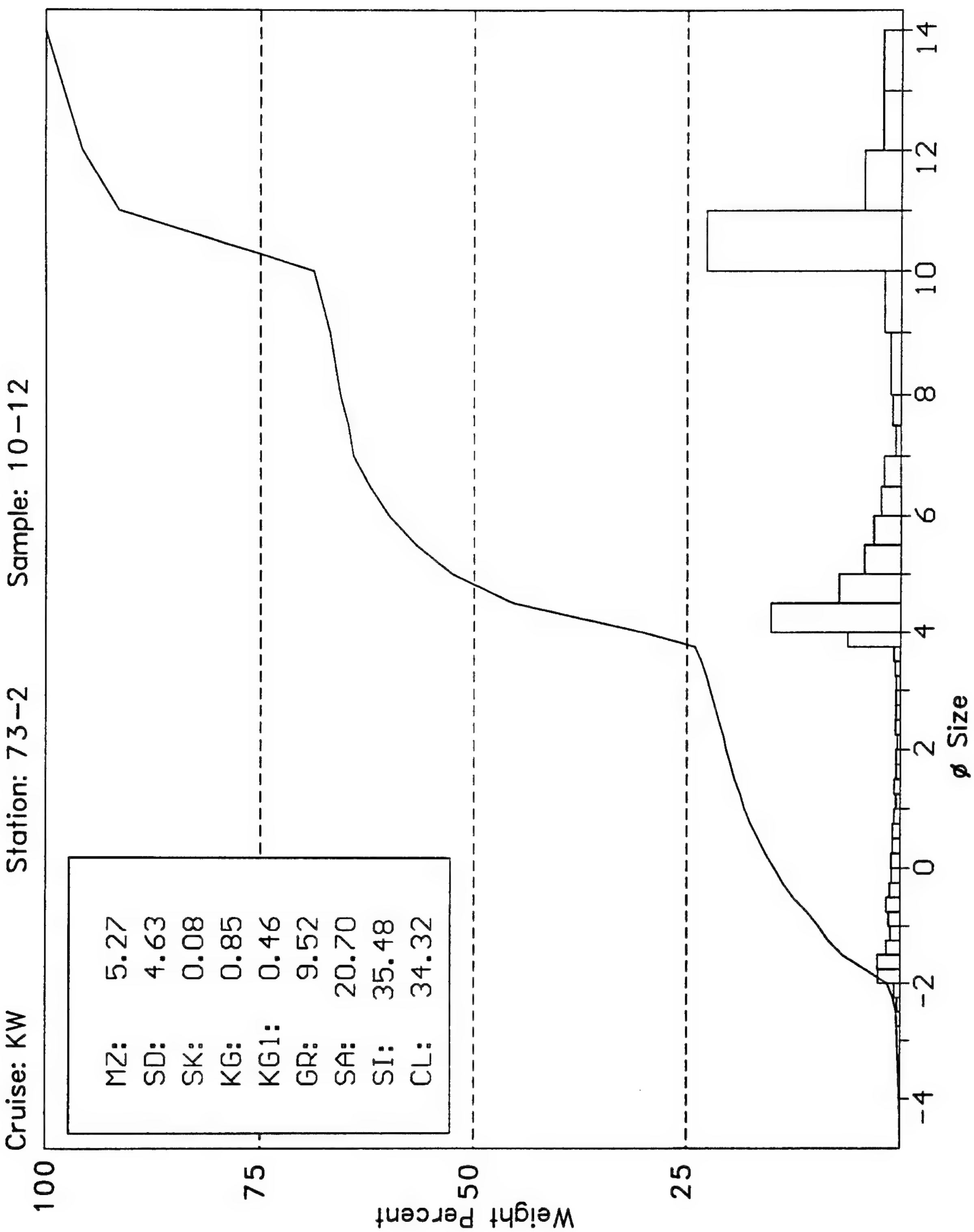
Cruise: KW
Station: 73-2
Sample: 2-4
MZ: 4.68
SD: 5.51
SK: -0.04
KG: 0.89
KG1: 0.47
GR: 17.11
SA: 15.99
SI: 34.66
CL: 32.22
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

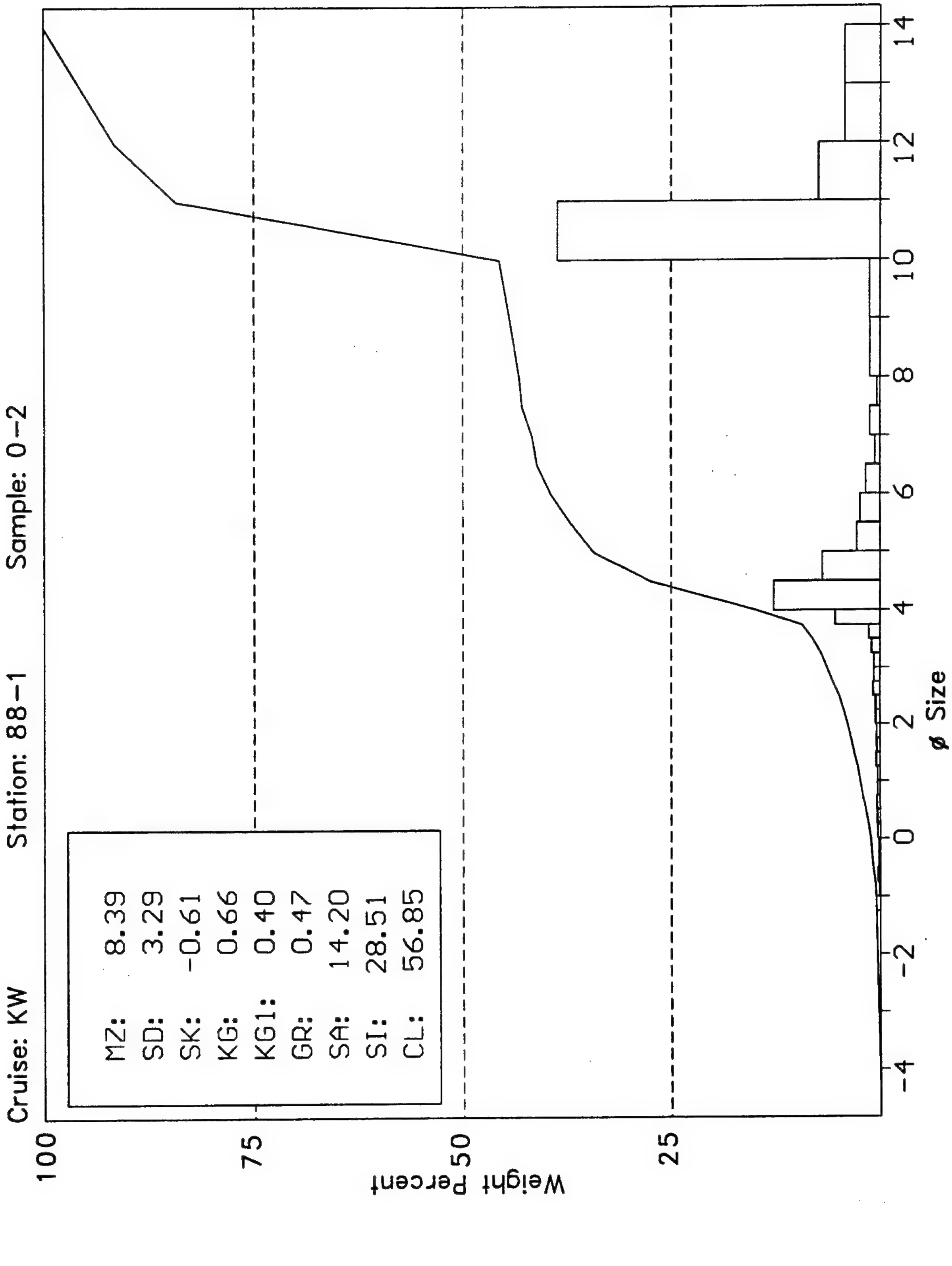

Cruise: KW
Station: 73-2
Sample: 4-6
MZ: 4.84
SD: 5.24
SK: 0.09
KG: 0.80
KG1: 0.44
GR: 15.46
SA: 22.26
SI: 34.66
CL: 27.62
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

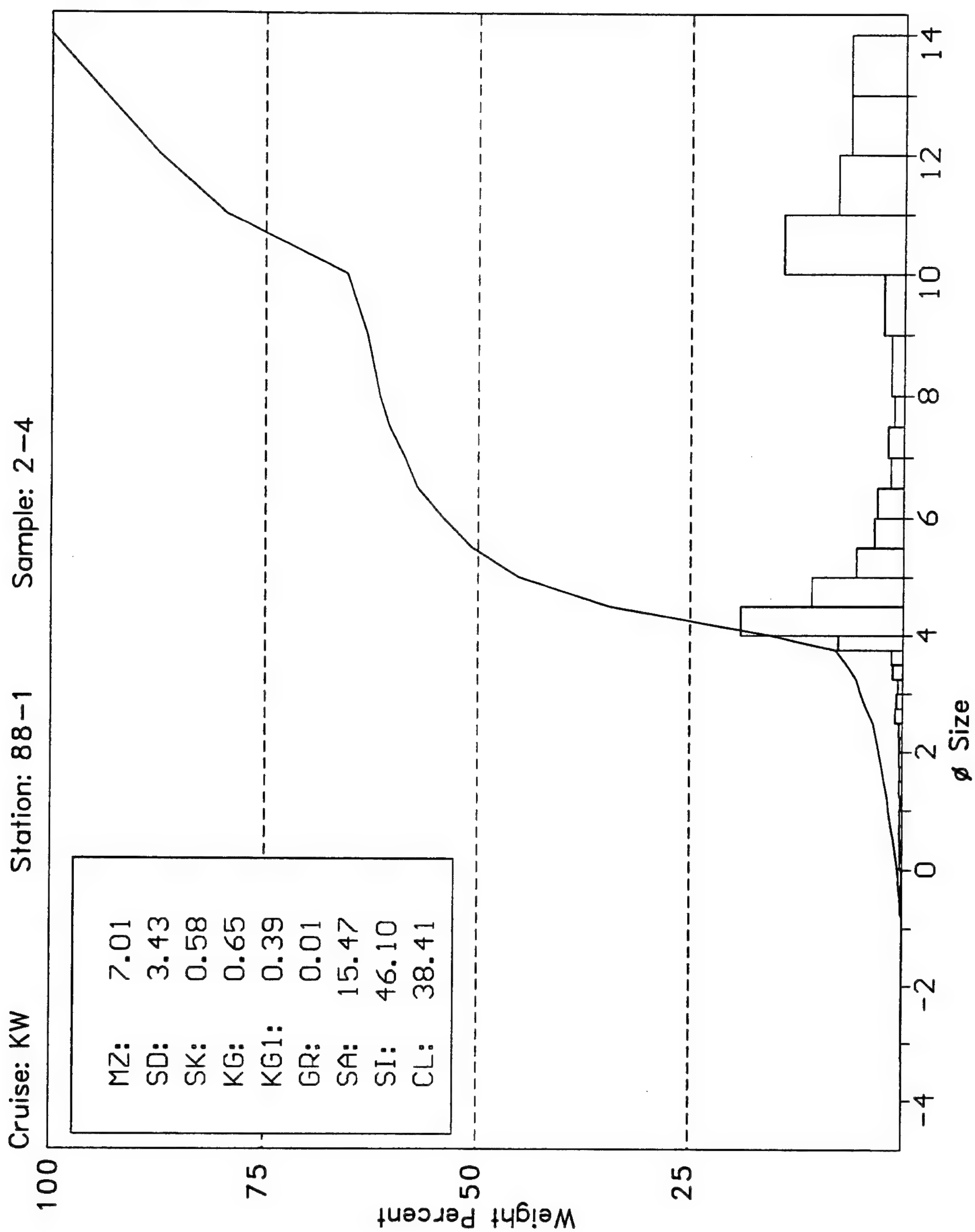

Cruise: KW
Station: 73-2
Sample: 6-8
MZ: 4.86
SD: 5.11
SK: 0.06
KG: 0.69
KG1: 0.41
GR: 14.20
SA: 22.34
SI: 33.39
CL: 30.09
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

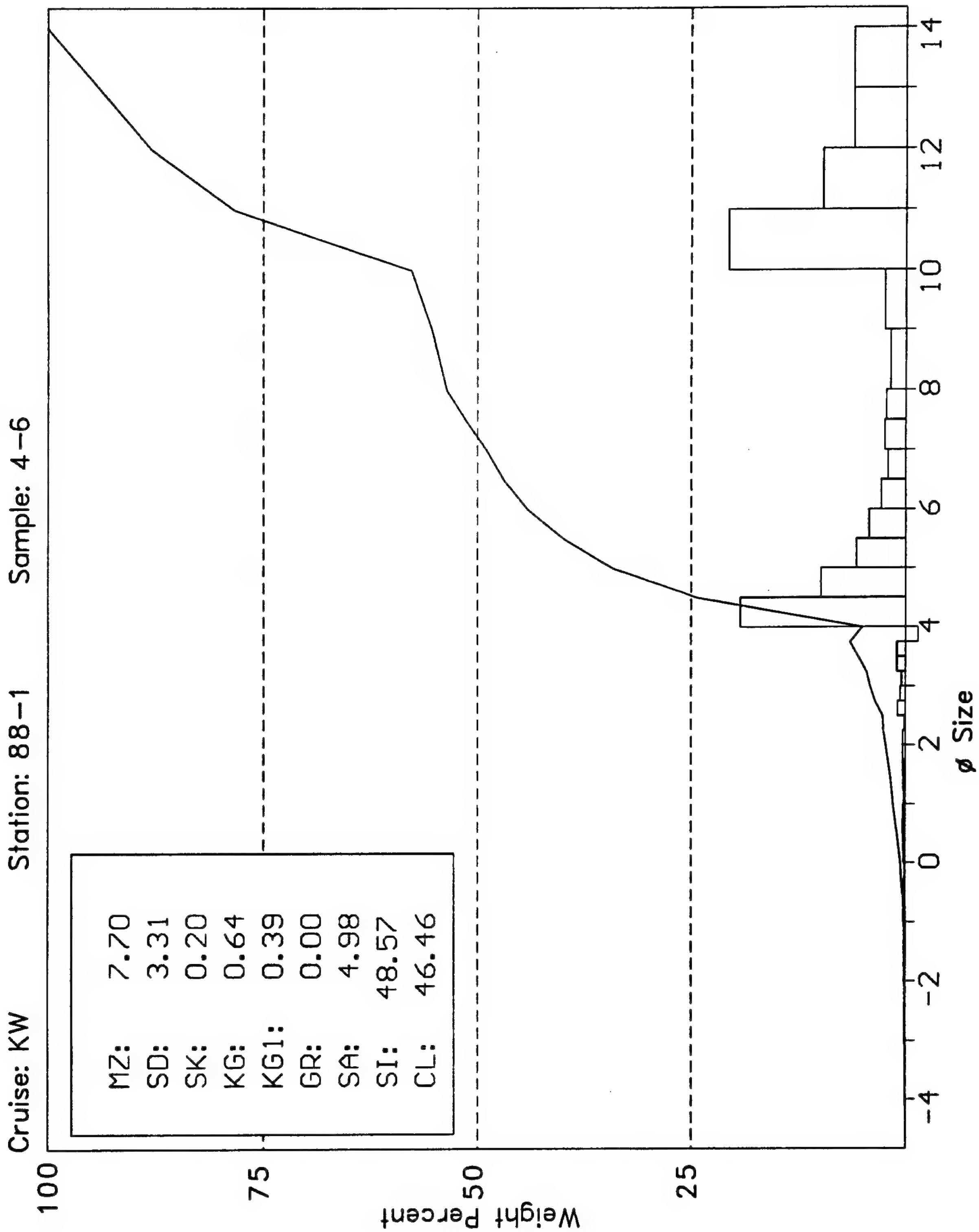


Cruise: KW
Station: 73-2
Sample: 8-10
MZ: 5.46
SD: 4.67
SK: 0.08
KG: 0.91
KG1: 0.48
GR: 9.14
SA: 18.26
SI: 36.39
CL: 36.22
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

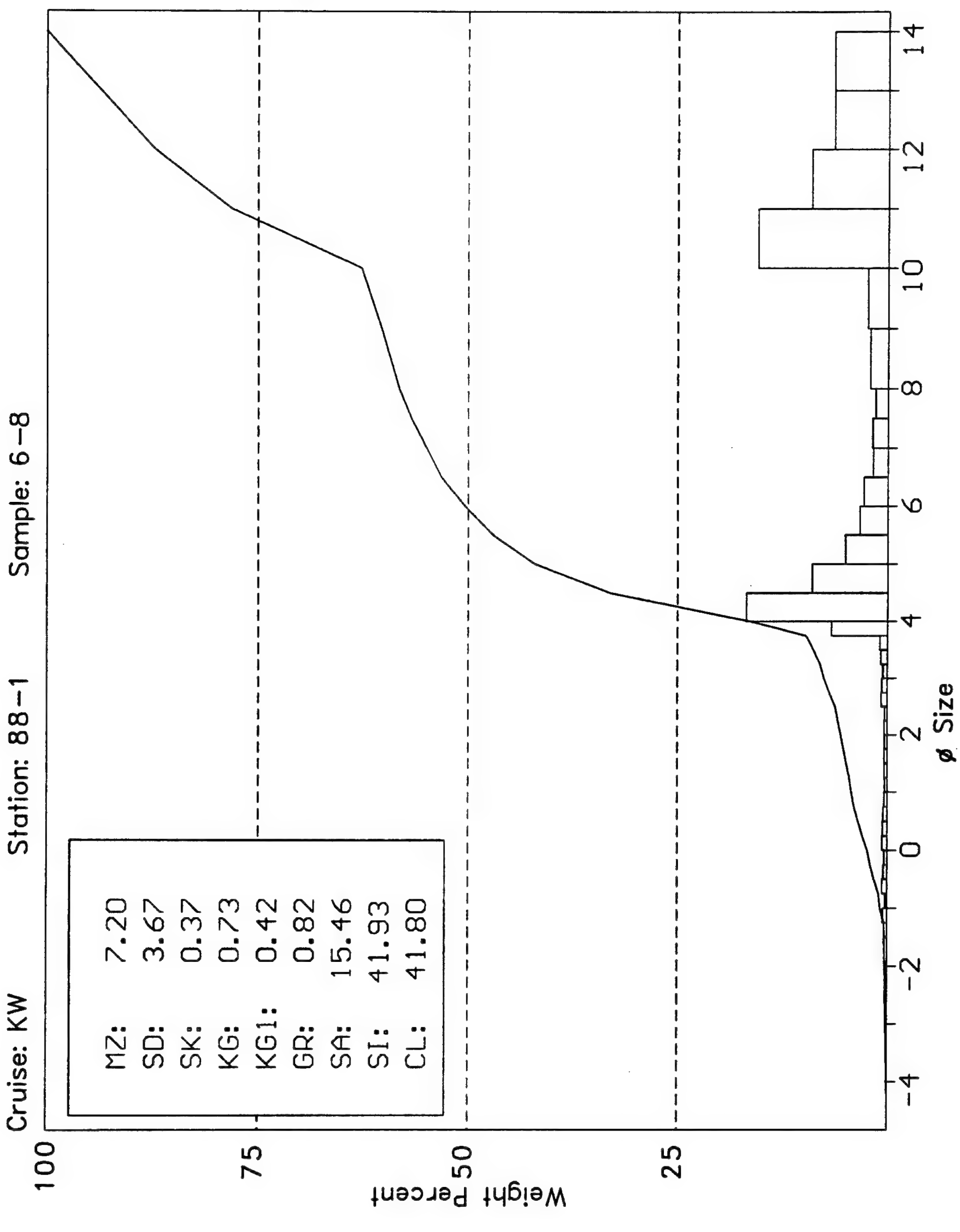

Cruise: KW
Station: 73-2
Sample: 10-12
MZ: 5.27
SD: 4.63
SK: 0.08
KG: 0.85
KG1: 0.46
GR: 9.52
SA: 20.70
SI: 35.48
CL: 34.32
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size


Cruise: KW
Station: 88-1
Sample: 0-2
MZ: 8.39
SD: 3.29
SK: -0.61
KG: 0.66
KG1: 0.40
GR: 0.47
SA: 14.20
SI: 28.51
CL: 56.85
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

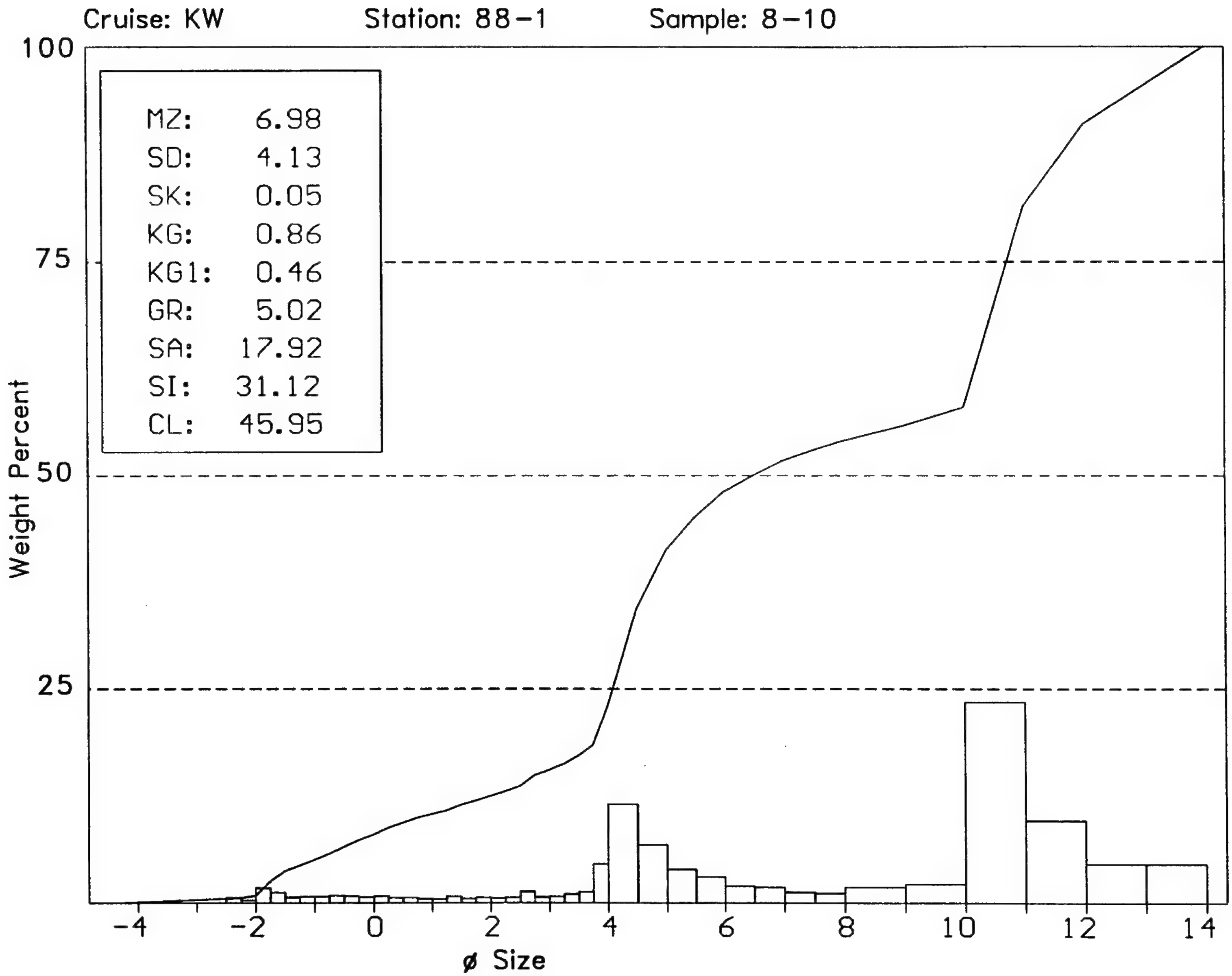

Cruise: KW
Station: 88-1
Sample: 2-4
MZ: 7.01
SD: 3.43
SK: 0.58
KG: 0.65
KG1: 0.39
GR: 0.01
SA: 15.47
SI: 46.10
CL: 38.41
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

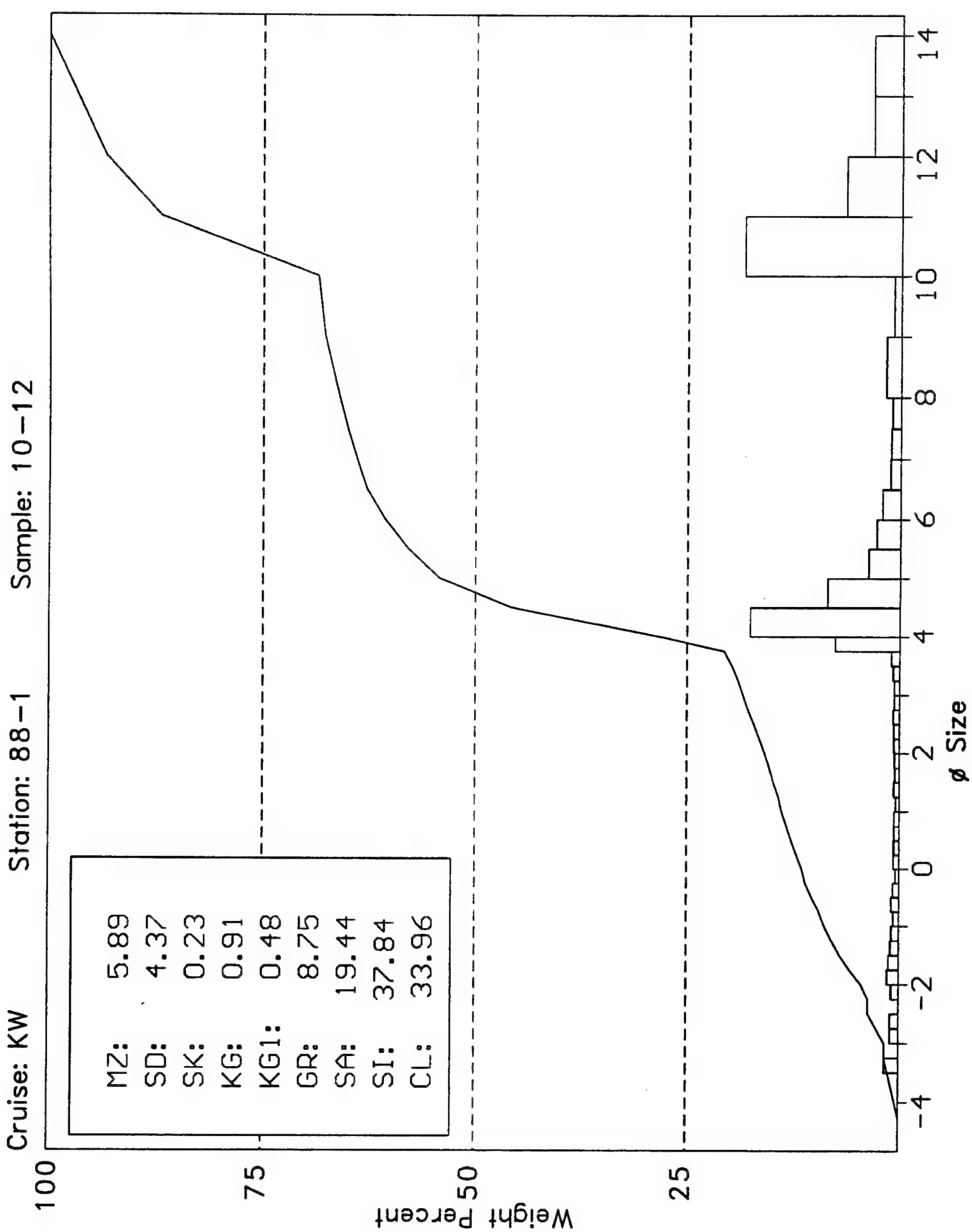


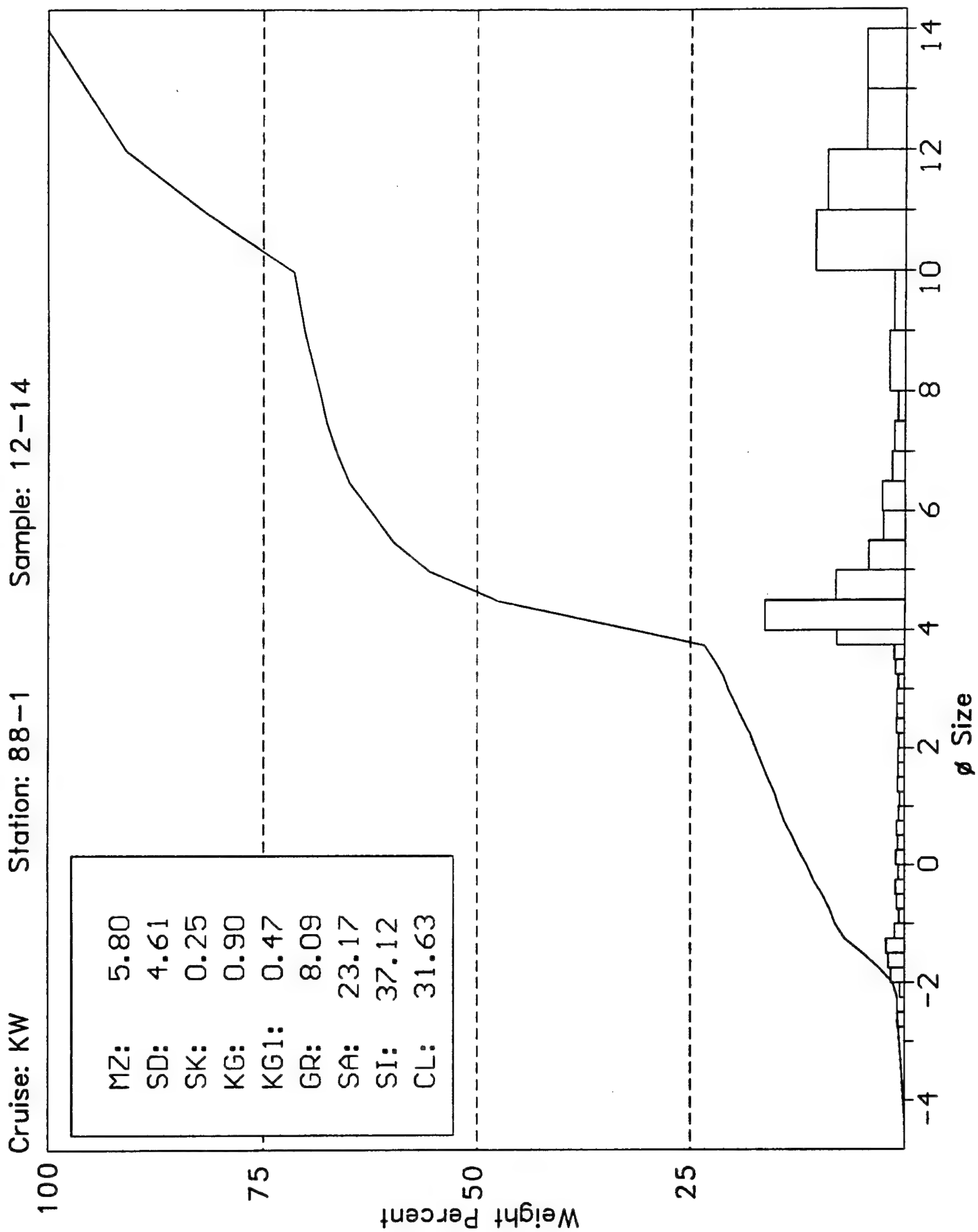
Cruise: KW
Station: 88-1
Sample: 4-6
MZ: 7.70
SD: 3.31
SK: 0.20
KG: 0.64
KG1: 0.39
GR: 0.00
SA: 4.98
SI: 48.57
CL: 46.46
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14



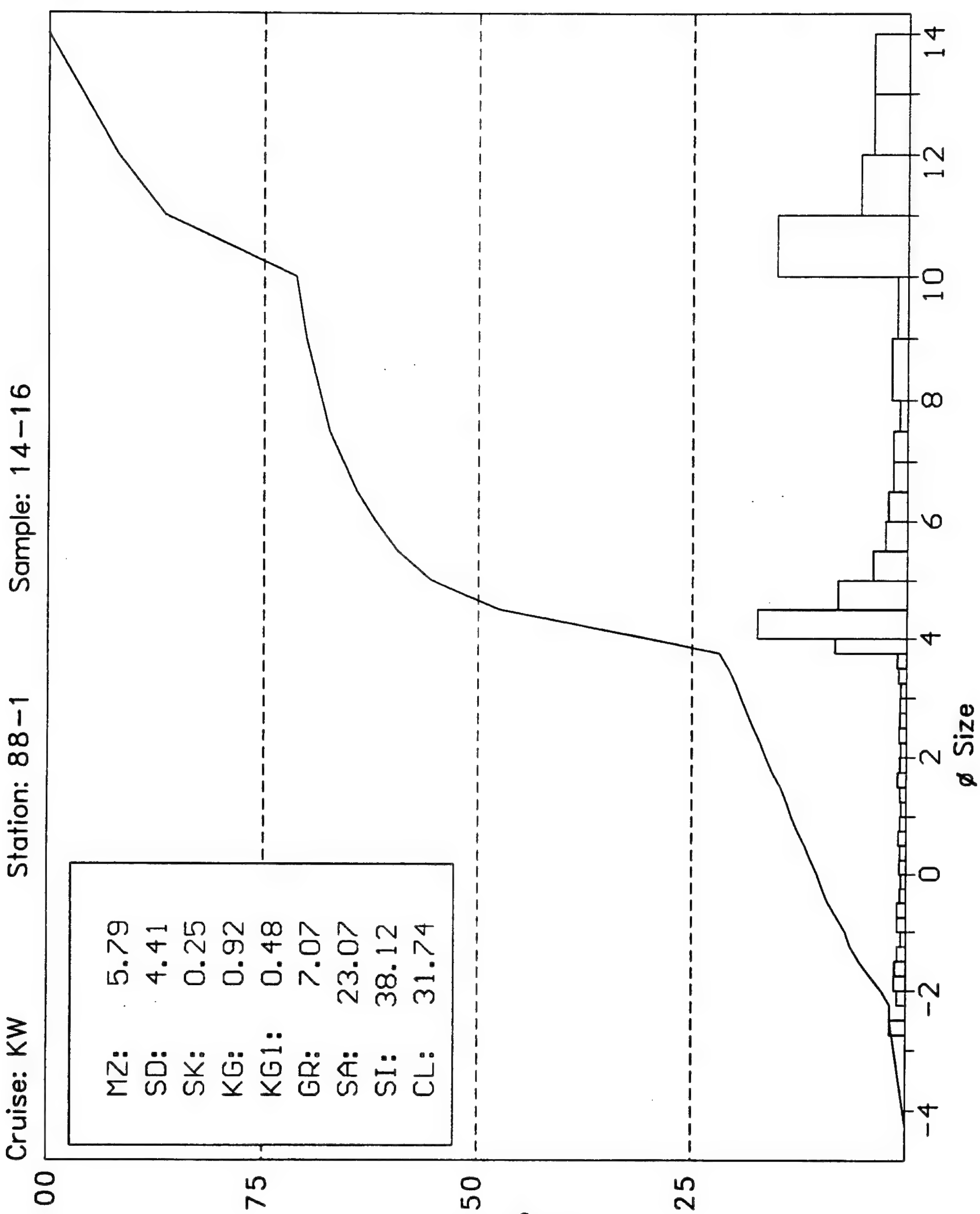
Cruise: KW
Station: 88-1
Sample: 6-8
MZ: 7.20
SD: 3.67
SK: 0.37
KG: 0.73
KG1: 0.42
GR: 0.82
SA: 15.46
SI: 41.93
CL: 41.80
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size


Cruise: KW
Station: 88-1
Sample: 8-10
MZ: 6.98
SD: 4.13
SK: 0.05
KG: 0.86
KG1: 0.46
GR: 5.02
SA: 17.92
SI: 31.12
CL: 45.95
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size


Cruise: KW
Station: 88-1
Sample: 10-12
MZ: 5.89
SD: 4.37
SK: 0.23
KG: 0.91
KG1: 0.48
GR: 8.75
SA: 19.44
SI: 37.84
CL: 33.96
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

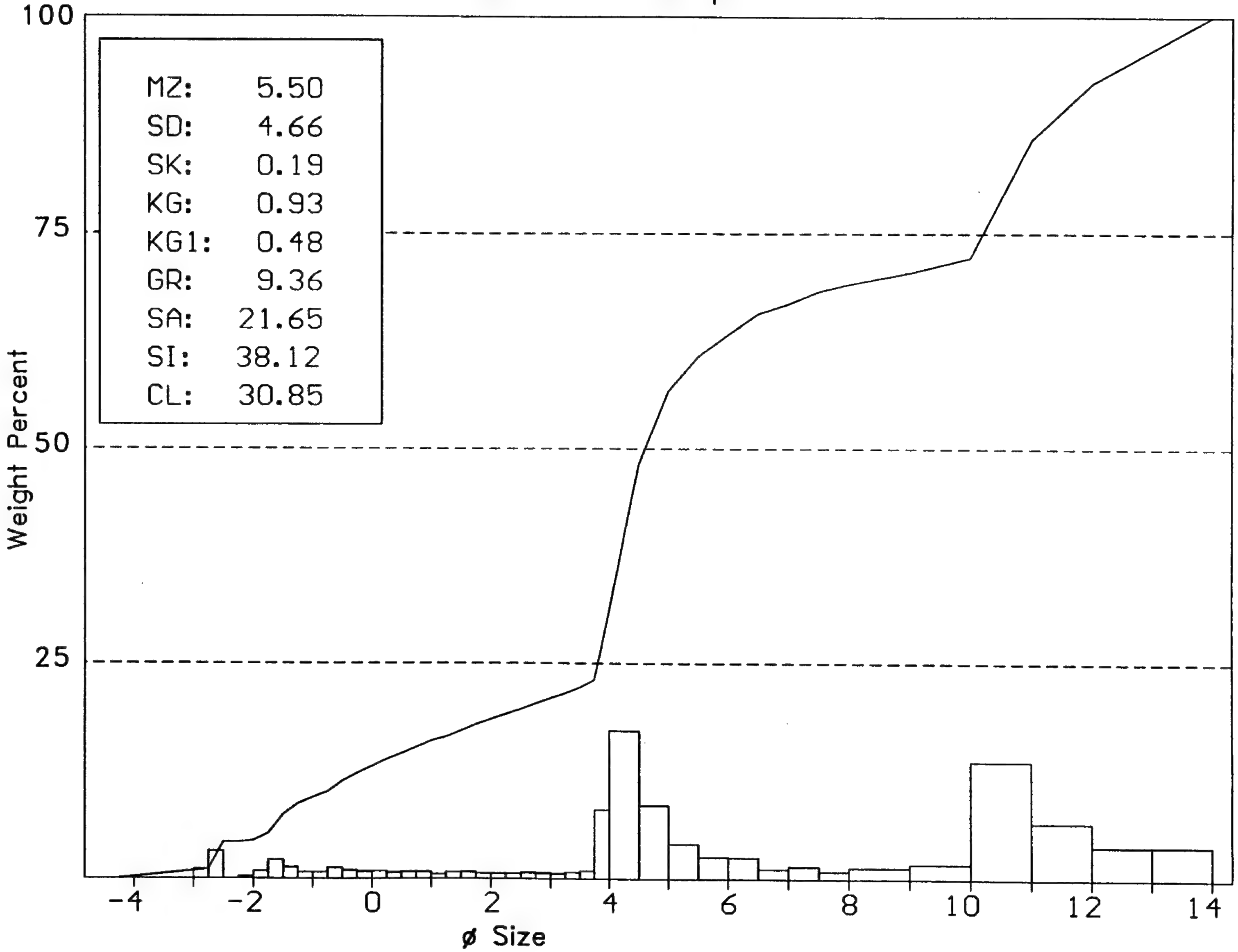


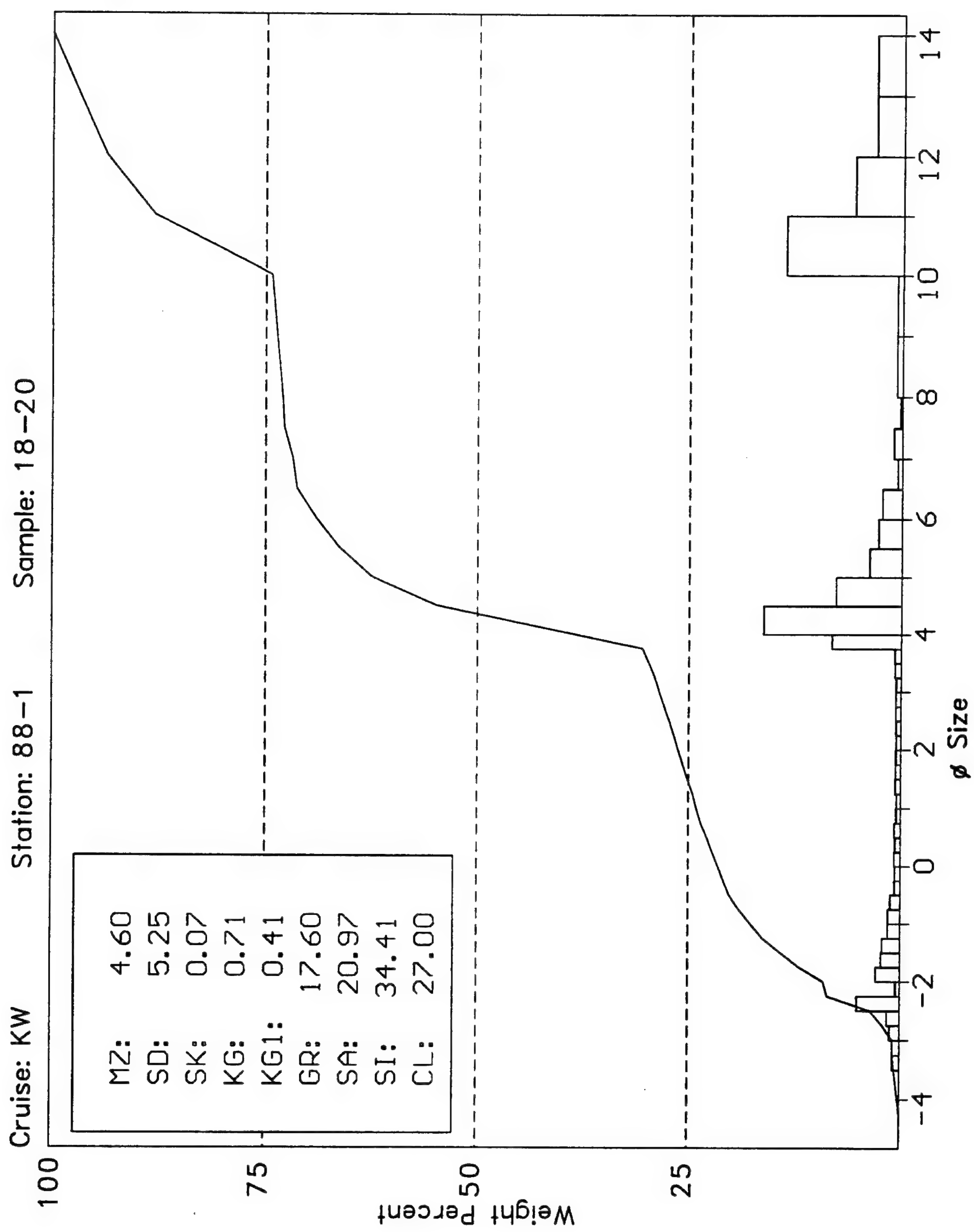
Cruise: KW
Station: 88-1
Sample: 12-14
MZ: 5.80
SD: 4.61
SK: 0.25
KG: 0.90
KG1: 0.47
GR: 8.09
SA: 23.17
SI: 37.12
CL: 31.63
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

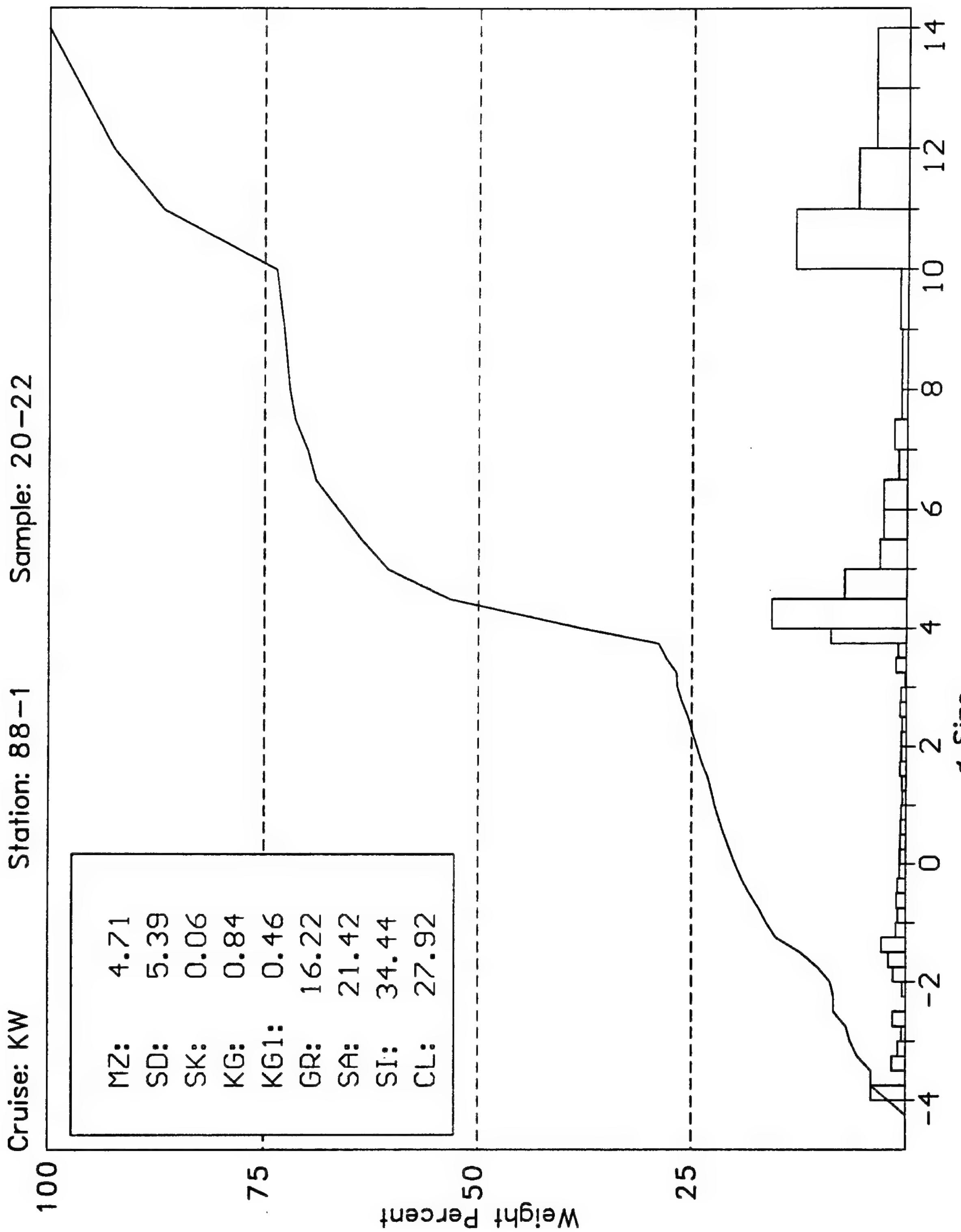


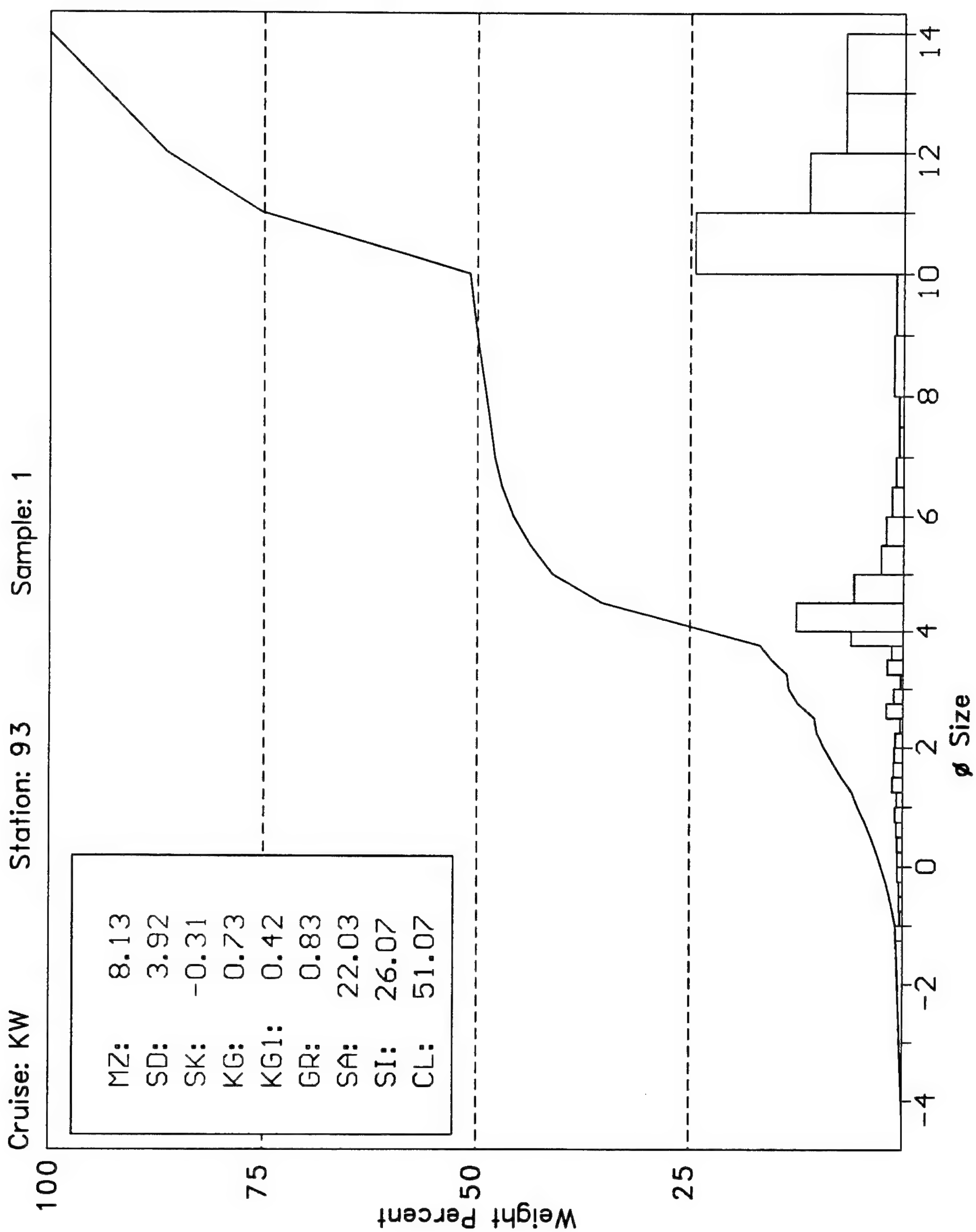
Cruise: KW
Station: 88-1
Sample: 14-16
MZ: 5.79
SD: 4.41
SK: 0.25
KG: 0.92
KG1: 0.48
GR: 7.07
SA: 23.07
SI: 38.12
CL: 31.74
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

Cruise: KW Station: 88-1 Sample: 16-18

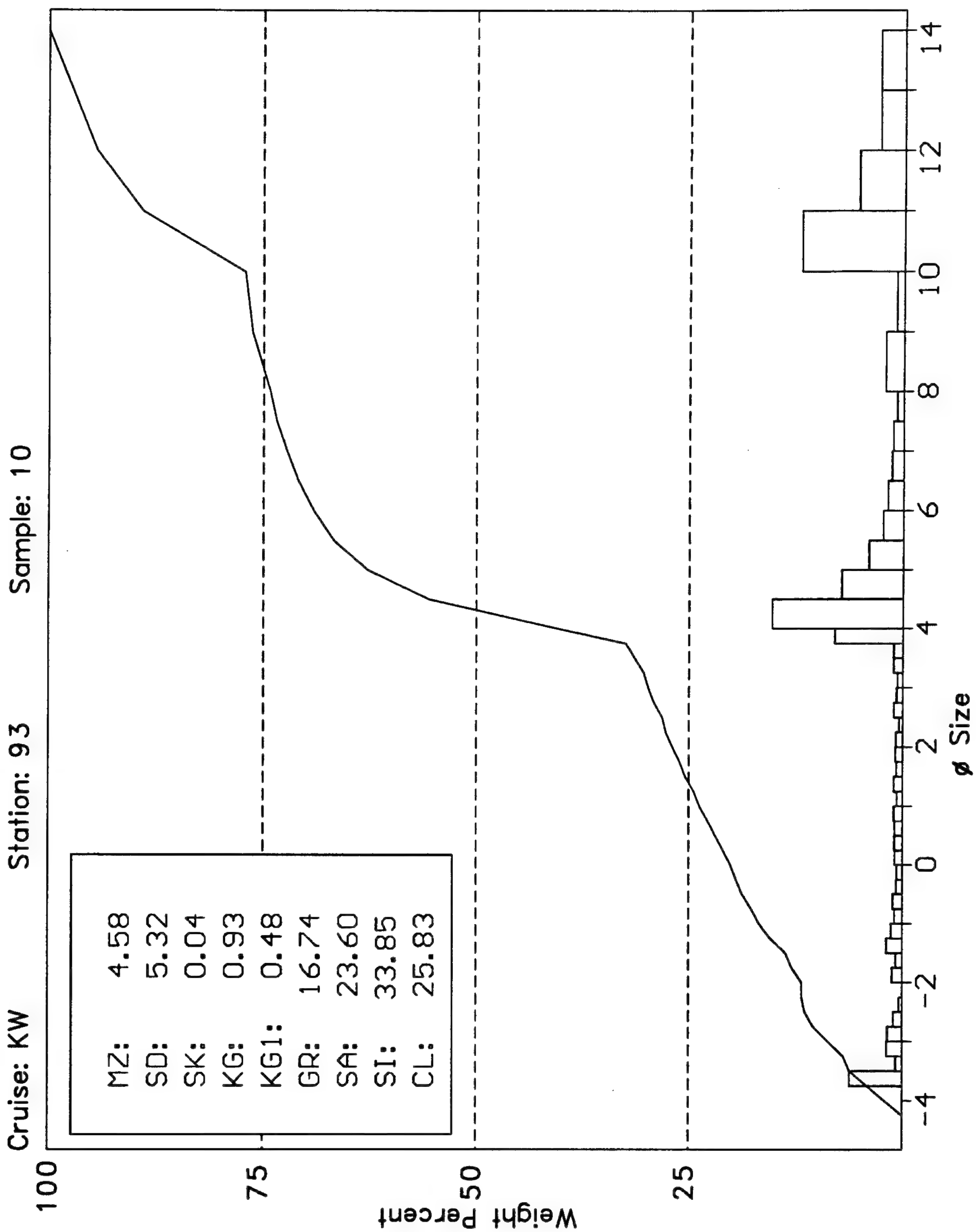


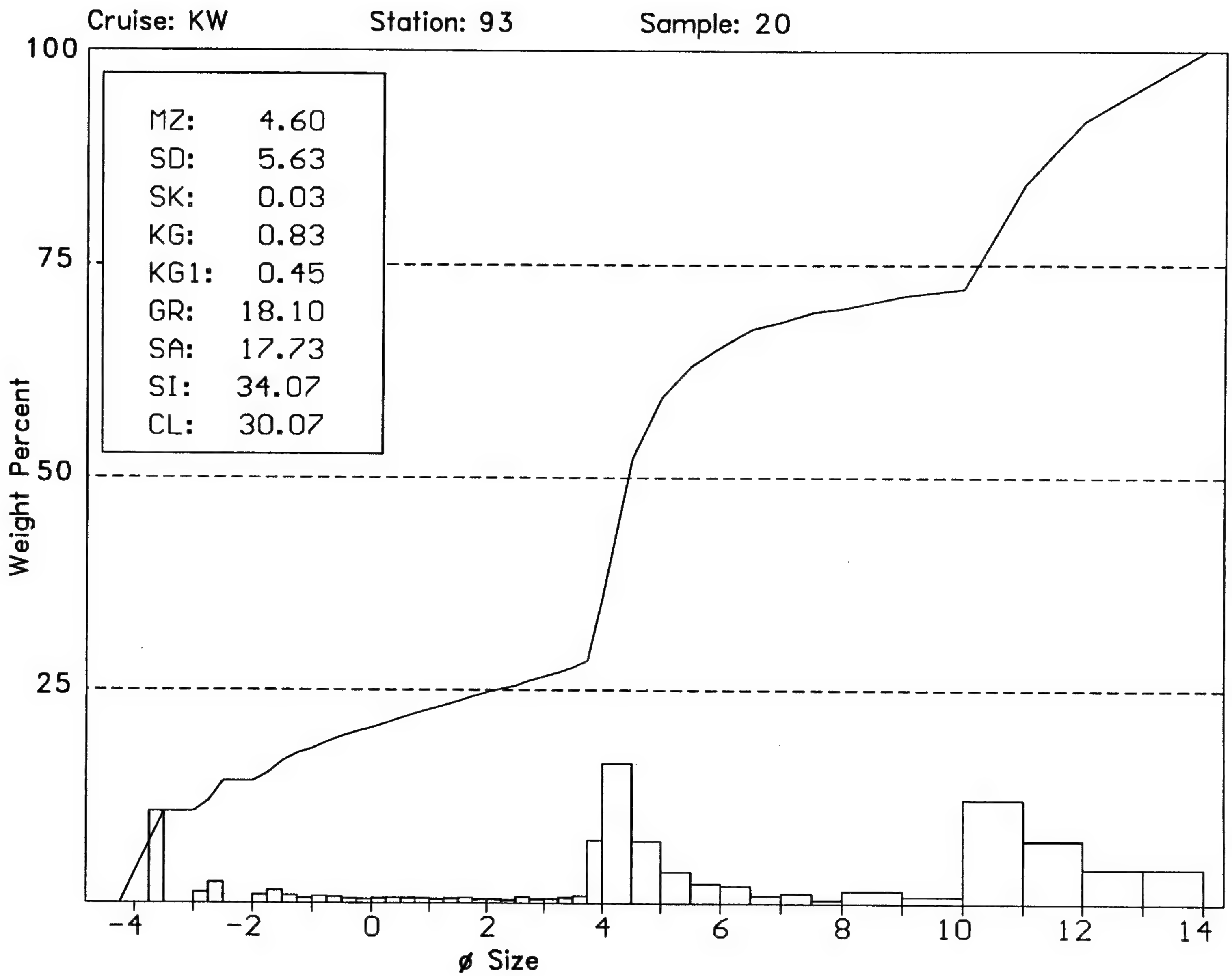

Cruise: KW
Station: 88-1
Sample: 18-20
MZ: 4.60
SD: 5.25
SK: 0.07
KG: 0.71
KG1: 0.41
GR: 17.60
SA: 20.97
SI: 34.41
CL: 27.00
Weight Percent
100
75
50
25
ϕ Size
-4
-2
0
2
4
6
8
10
12
14

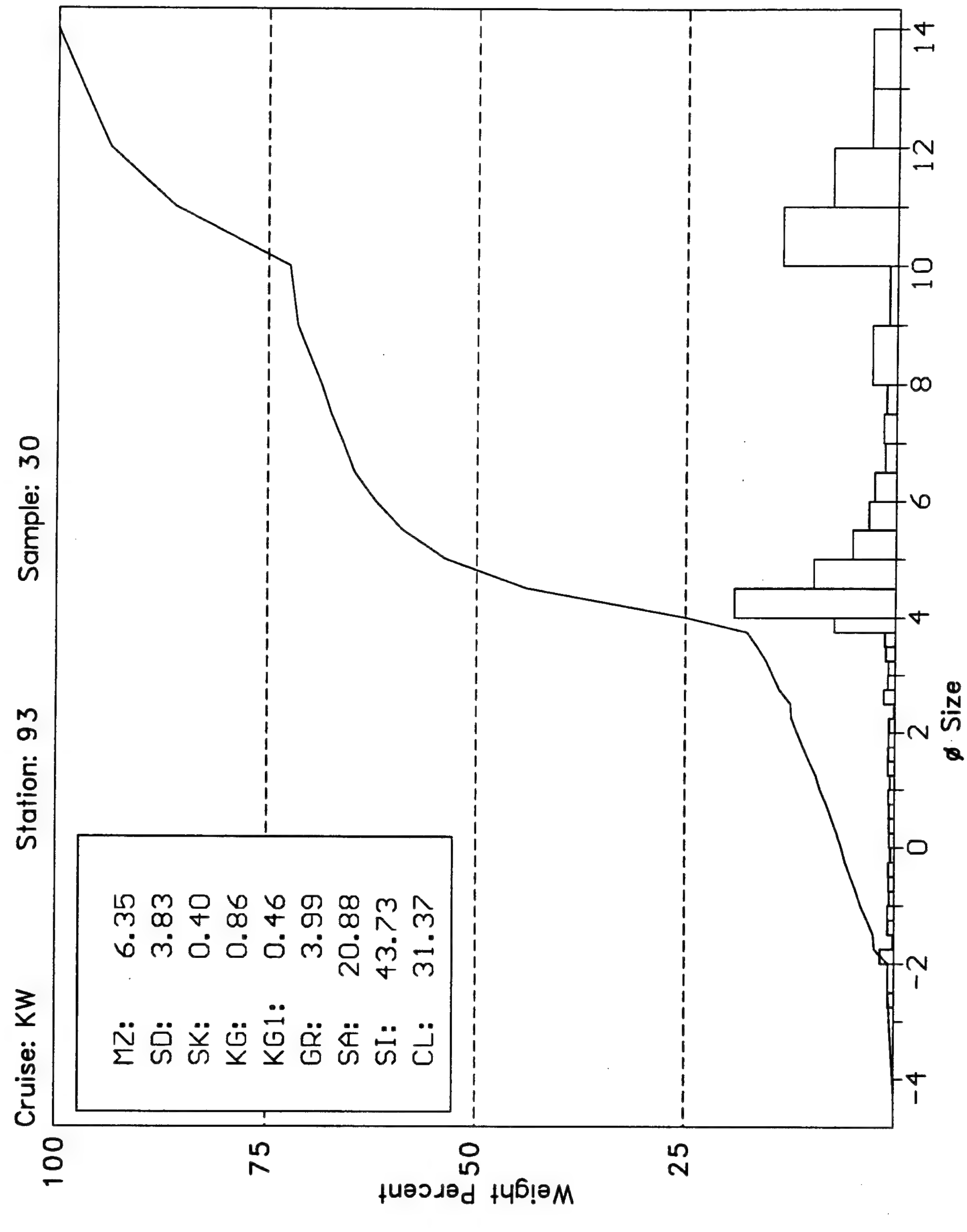

Cruise: KW
Station: 88-1
Sample: 20-22
MZ: 4.71
SD: 5.39
SK: 0.06
KG: 0.84
KG1: 0.46
GR: 16.22
SA: 21.42
SI: 34.44
CL: 27.92
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

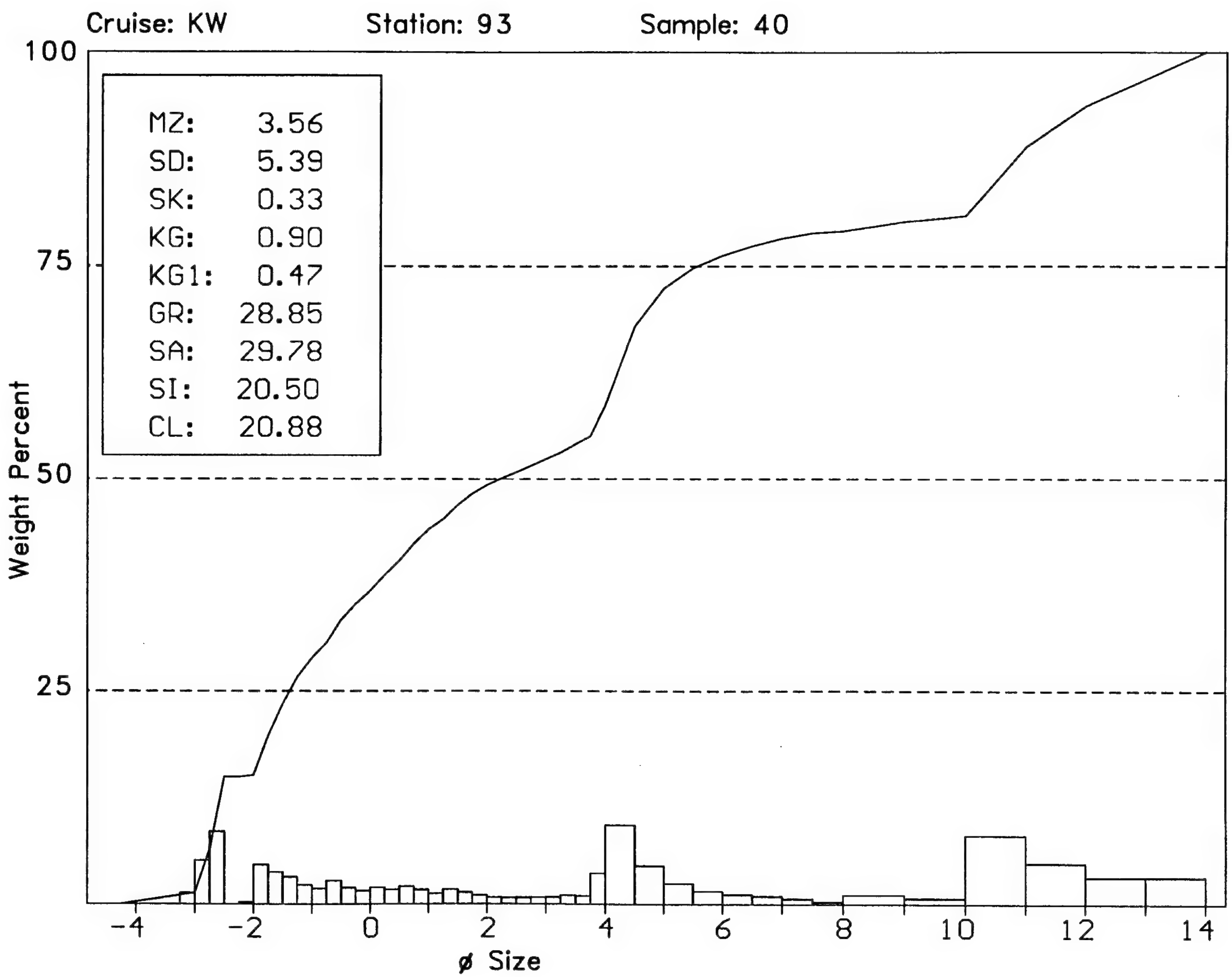


Cruise: KW
Station: 93
Sample: 1
MZ: 8.13
SD: 3.92
SK: -0.31
KG: 0.73
KG1: 0.42
GR: 0.83
SA: 22.03
SI: 26.07
CL: 51.07
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

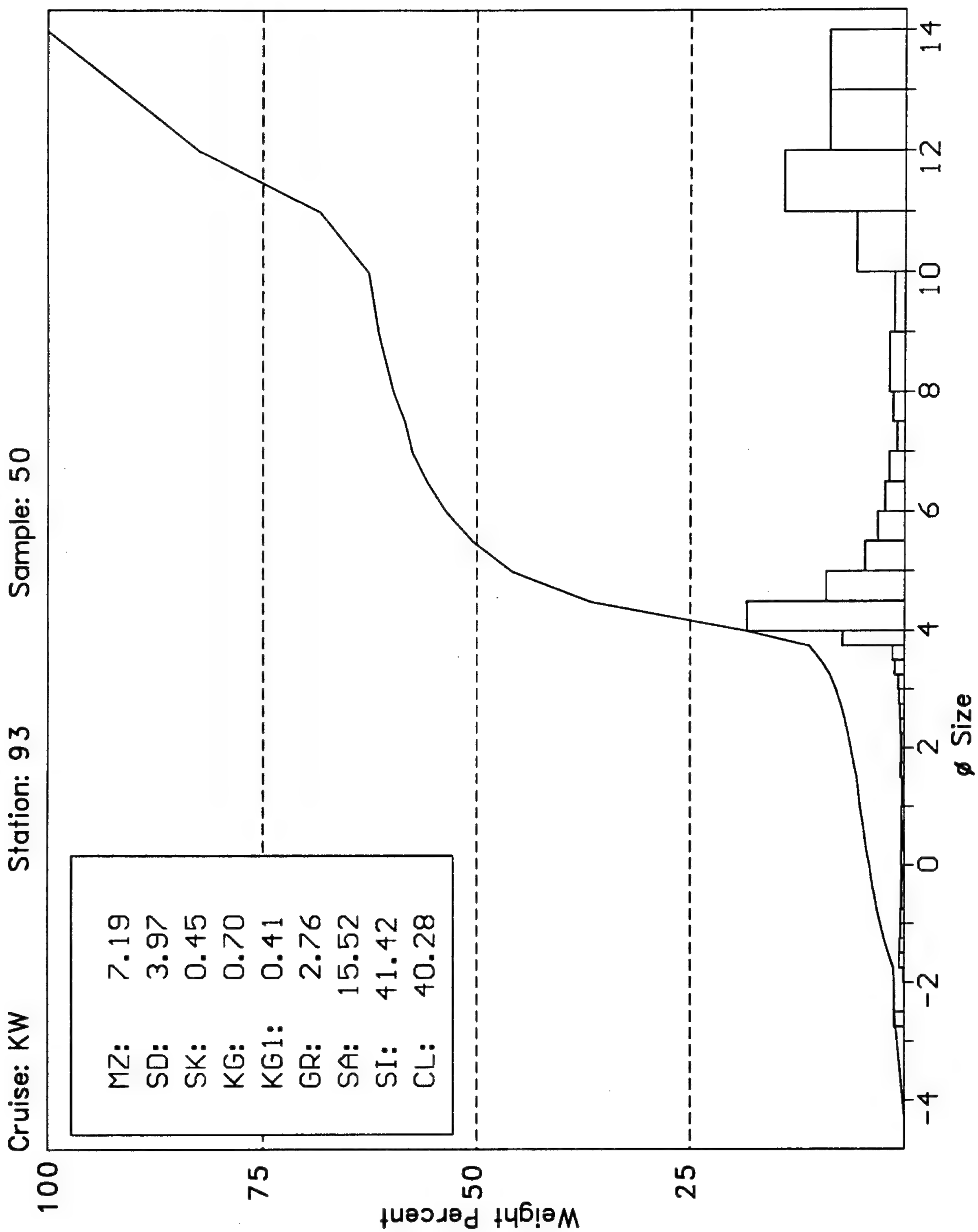

Cruise: KW
Station: 93
Sample: 10
MZ: 4.58
SD: 5.32
SK: 0.04
KG: 0.93
KG1: 0.48
GR: 16.74
SA: 23.60
SI: 33.85
CL: 25.83
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size


Cruise: KW
Station: 93
Sample: 20
MZ: 4.60
SD: 5.63
SK: 0.03
KG: 0.83
KG1: 0.45
GR: 18.10
SA: 17.73
SI: 34.07
CL: 30.07
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

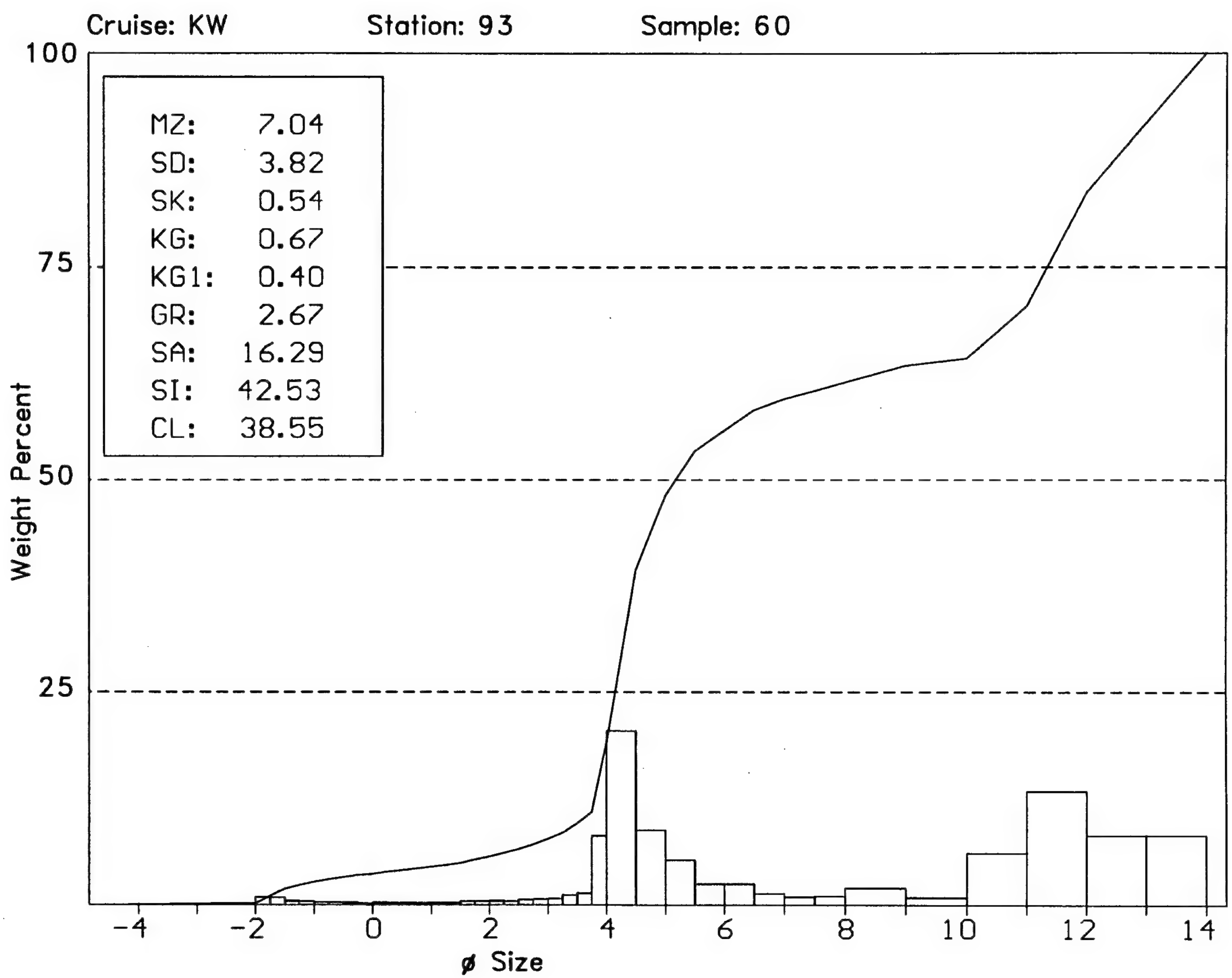

Cruise: KW
Station: 93
Sample: 30
MZ: 6.35
SD: 3.83
SK: 0.40
KG: 0.86
KG1: 0.46
GR: 3.99
SA: 20.88
SI: 43.73
CL: 31.37
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

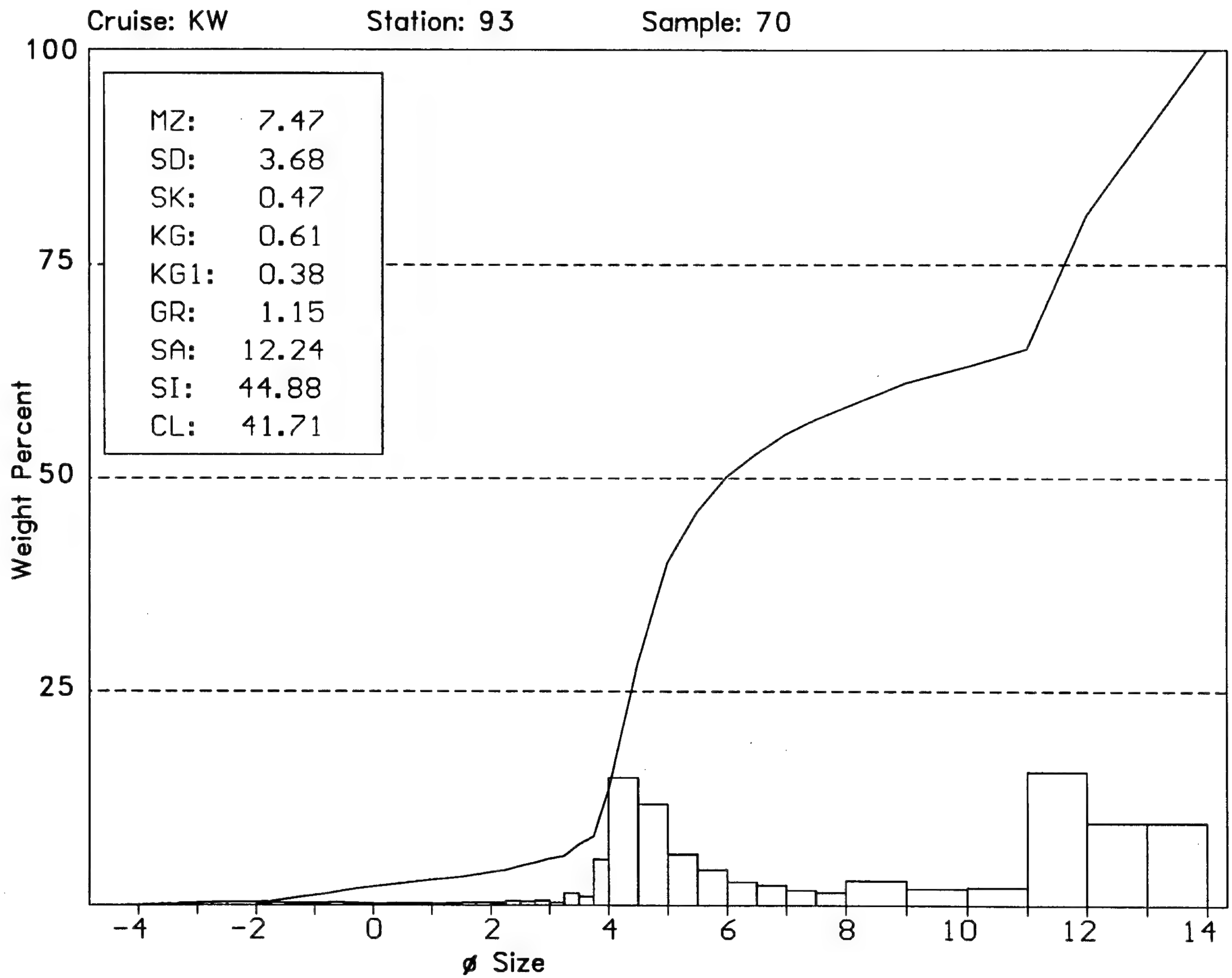


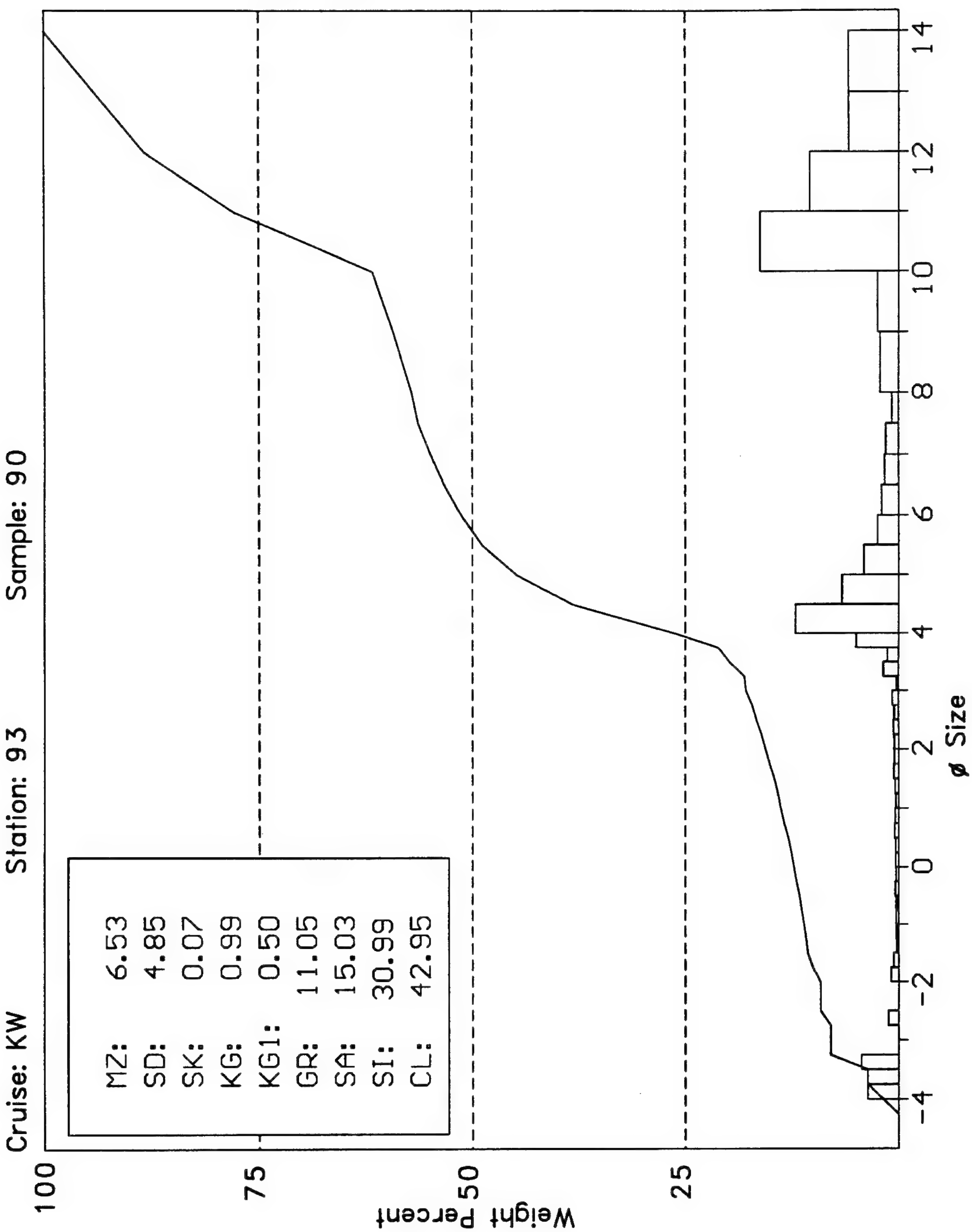
Cruise: KW
Station: 93
Sample: 40
MZ: 3.56
SD: 5.39
SK: 0.33
KG: 0.90
KG1: 0.47
GR: 28.85
SA: 29.78
SI: 20.50
CL: 20.88
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

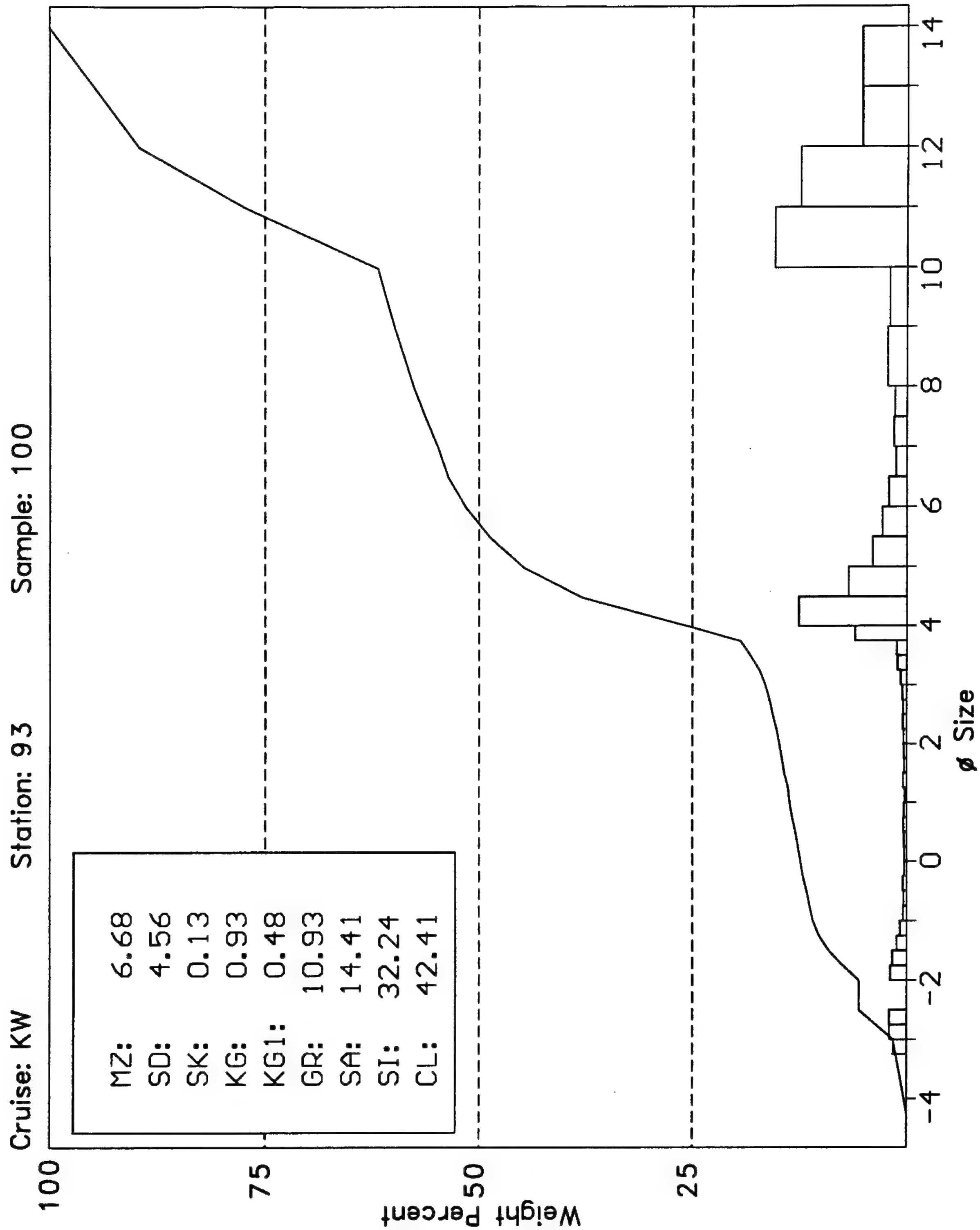


Cruise: KW
Station: 93
Sample: 50
MZ: 7.19
SD: 3.97
SK: 0.45
KG: 0.70
KG1: 0.41
GR: 2.76
SA: 15.52
SI: 41.42
CL: 40.28
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

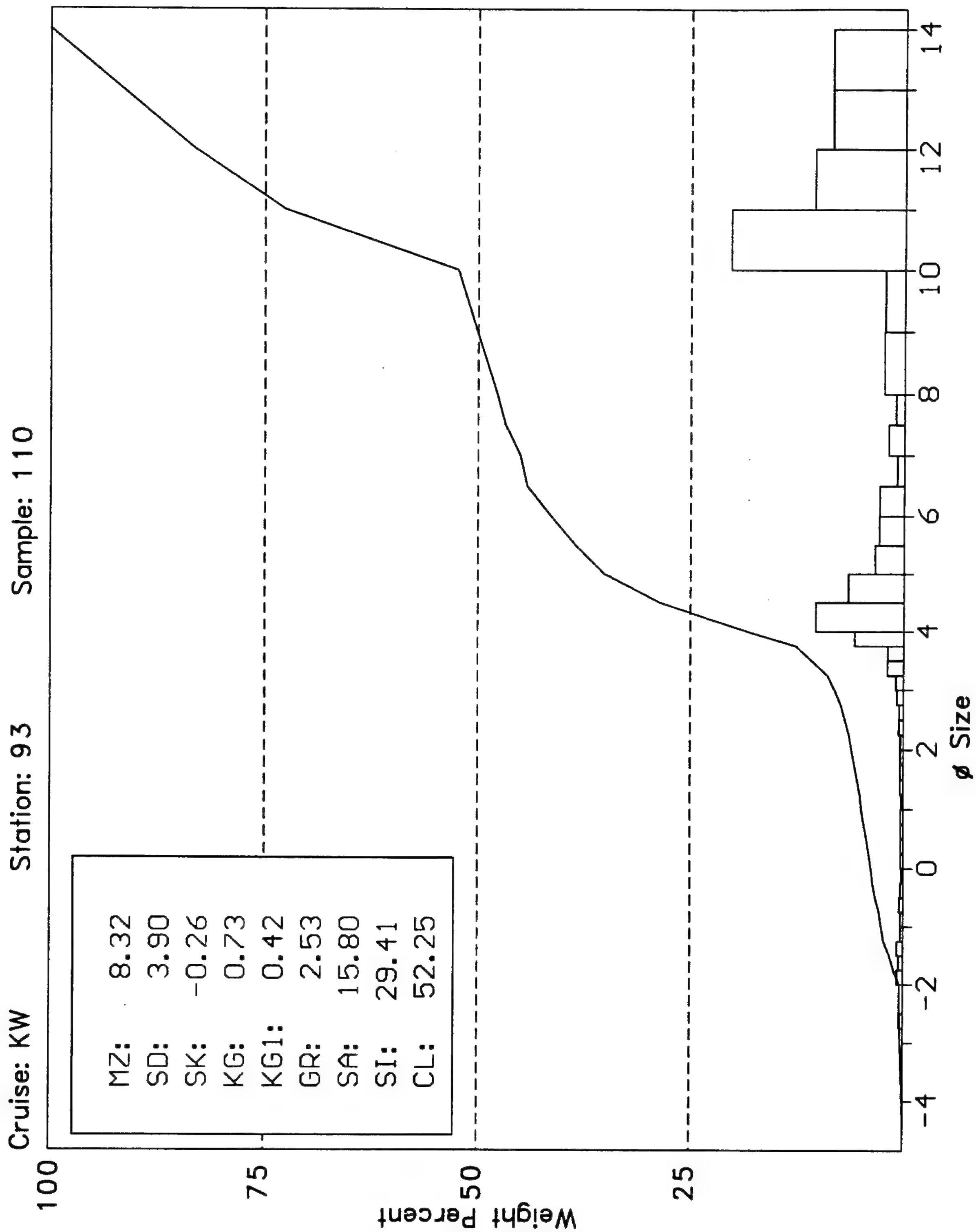

Cruise: KW
Station: 93
Sample: 60
MZ: 7.04
SD: 3.82
SK: 0.54
KG: 0.67
KG1: 0.40
GR: 2.67
SA: 16.29
SI: 42.53
CL: 38.55
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size


Cruise: KW
Station: 93
Sample: 70
MZ: 7.47
SD: 3.68
SK: 0.47
KG: 0.61
KG1: 0.38
GR: 1.15
SA: 12.24
SI: 44.88
CL: 41.71
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

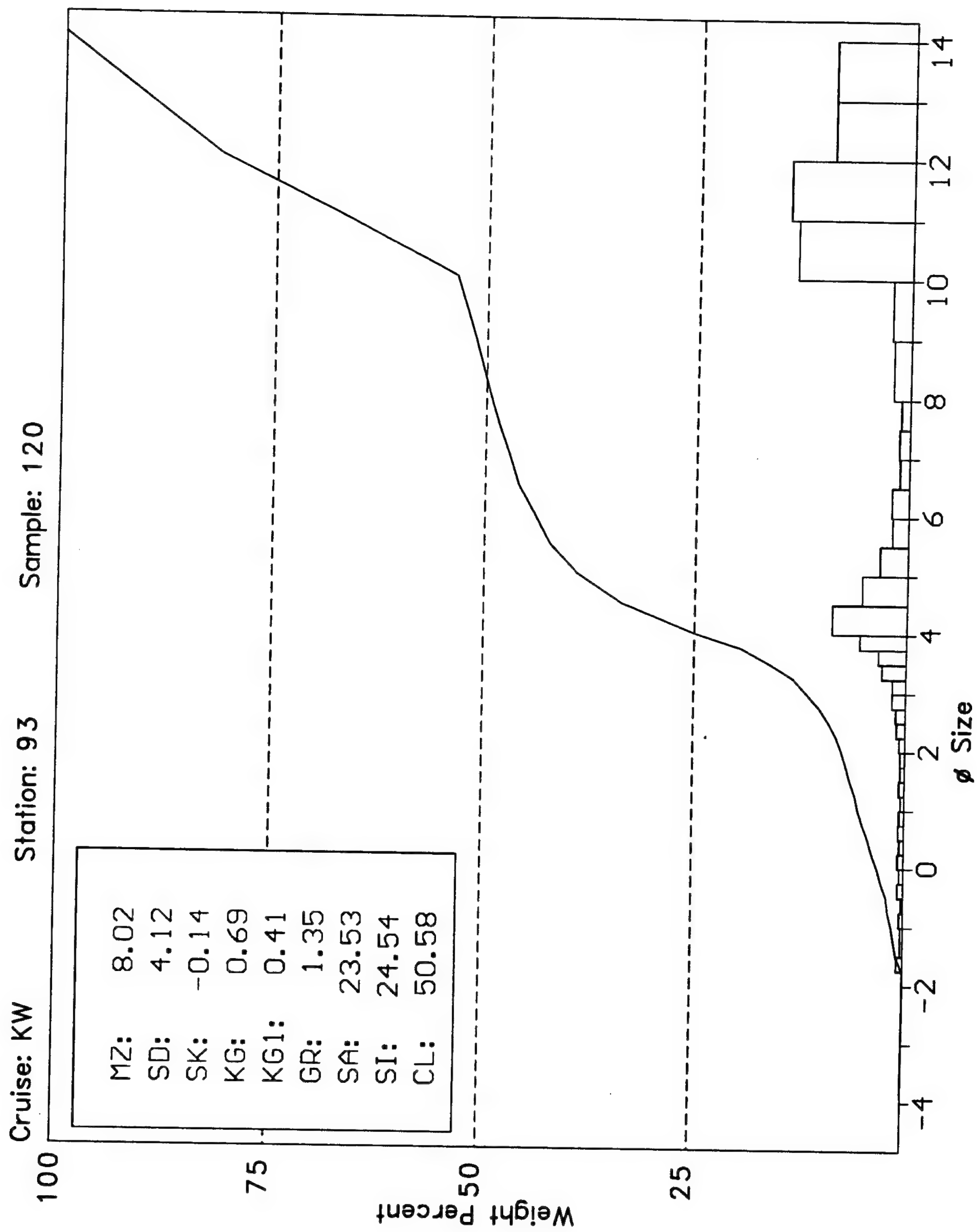

Cruise: KW
Station: 93
Sample: 90
MZ: 6.53
SD: 4.85
SK: 0.07
KG: 0.99
KG1: 0.50
GR: 11.05
SA: 15.03
SI: 30.99
CL: 42.95
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

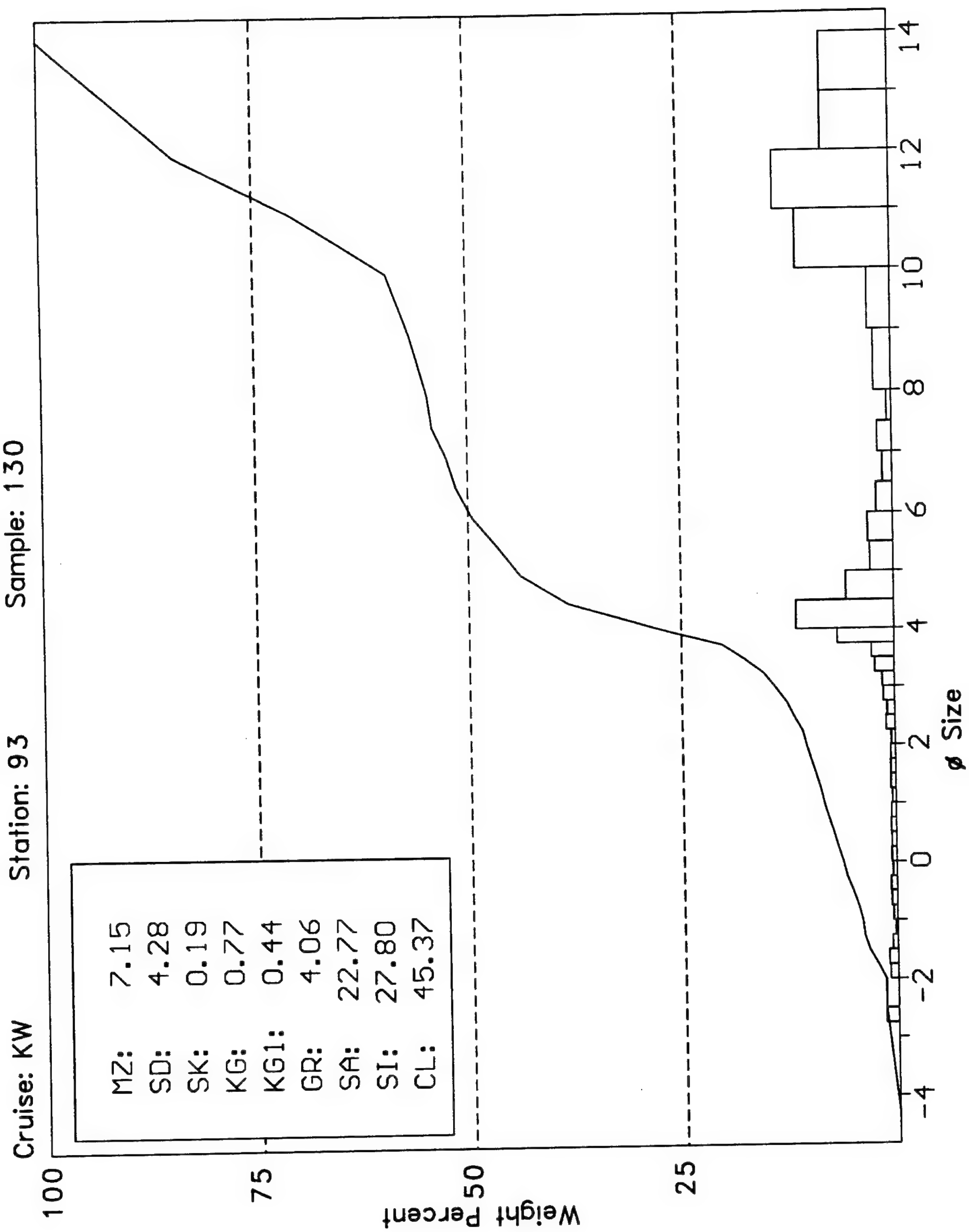


Cruise: KW
Station: 93
Sample: 100
MZ: 6.68
SD: 4.56
SK: 0.13
KG: 0.93
KG1: 0.48
GR: 10.93
SA: 14.41
SI: 32.24
CL: 42.41
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

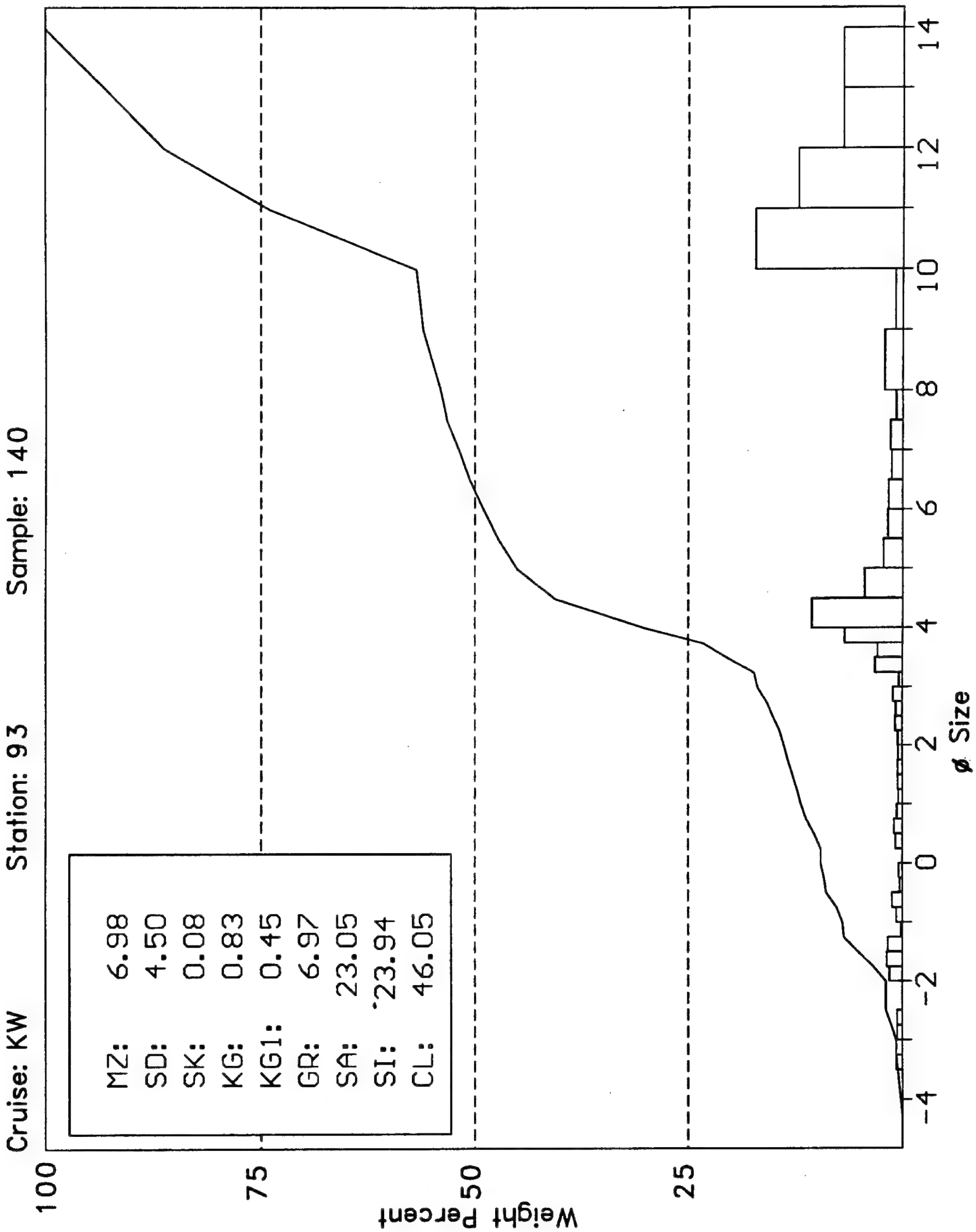


Cruise: KW
Station: 93
Sample: 110
MZ: 8.32
SD: 3.90
SK: -0.26
KG: 0.73
KG1: 0.42
GR: 2.53
SA: 15.80
SI: 29.41
CL: 52.25
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

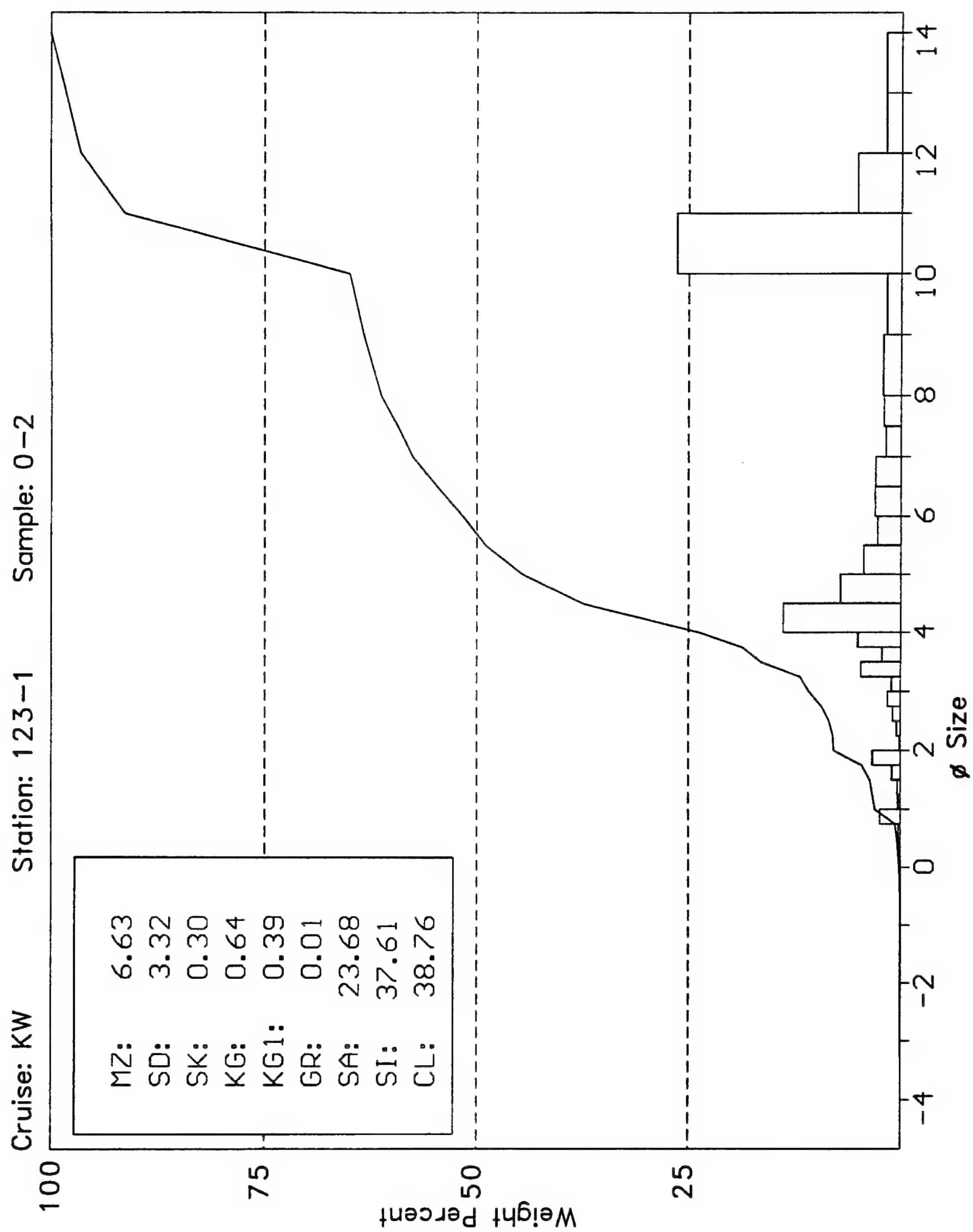

Cruise: KW
Station: 93
Sample: 120
MZ: 8.02
SD: 4.12
SK: -0.14
KG: 0.69
KG1: 0.41
GR: 1.35
SA: 23.53
SI: 24.54
CL: 50.58
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14



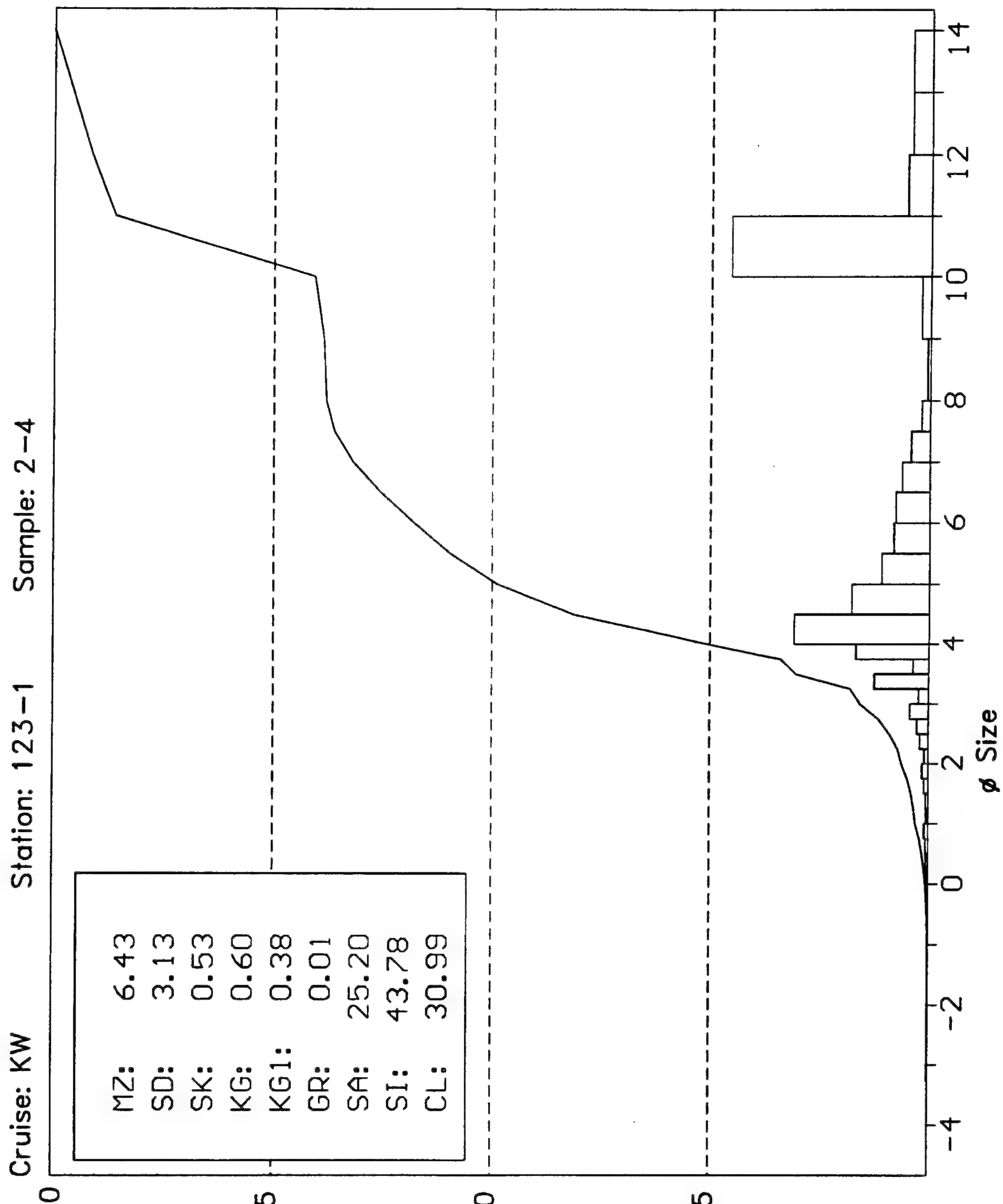
Cruise: KW
Station: 93
Sample: 130
MZ: 7.15
SD: 4.28
SK: 0.19
KG: 0.77
KG1: 0.44
GR: 4.06
SA: 22.77
SI: 27.80
CL: 45.37
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

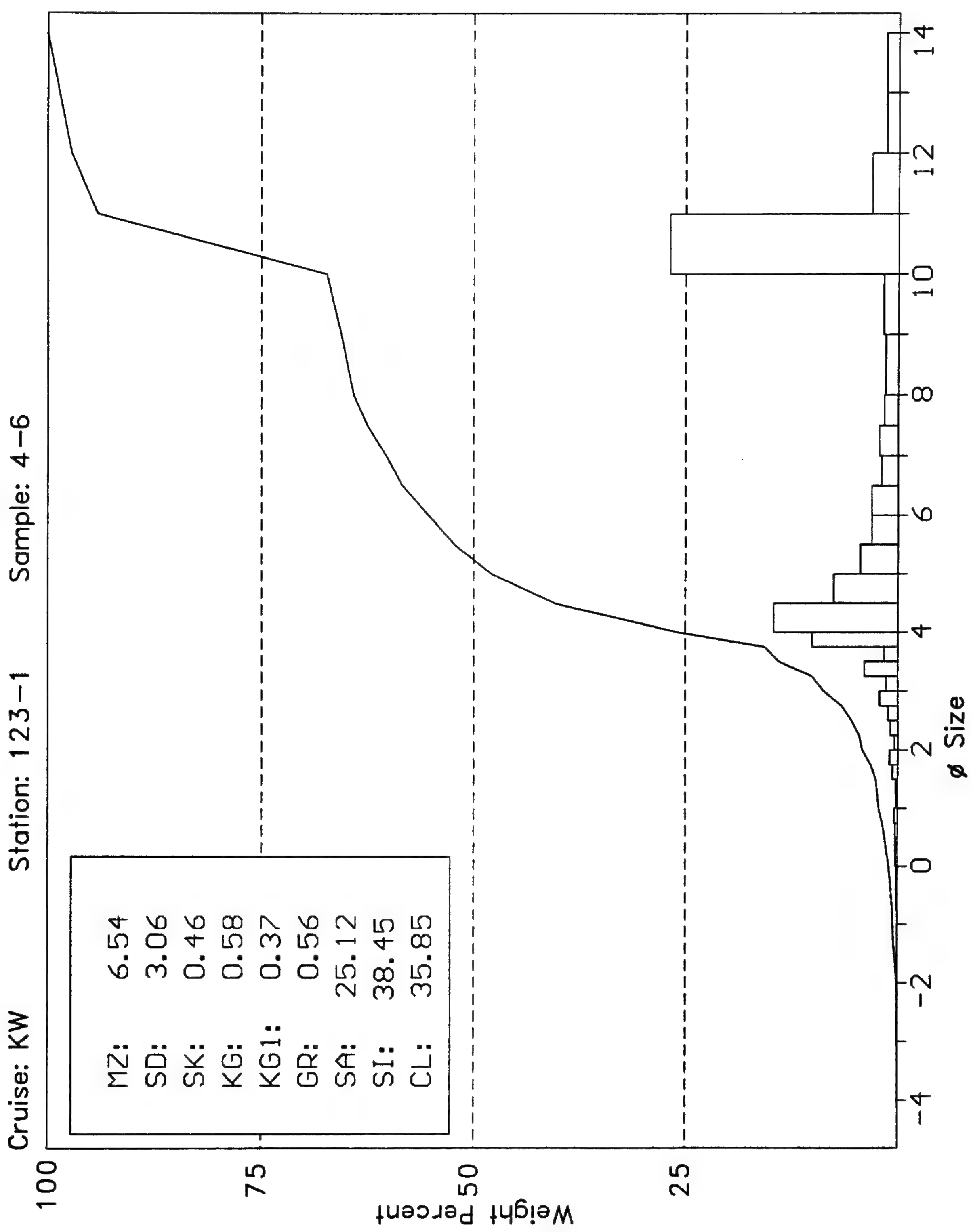


Cruise: KW
Station: 93
Sample: 140
MZ: 6.98
SD: 4.50
SK: 0.08
KG: 0.83
KG1: 0.45
GR: 6.97
SA: 23.05
SI: 23.94
CL: 46.05
Weight Percent
100
75
50
25
ϕ Size
-4
-2
0
2
4
6
8
10
12
14

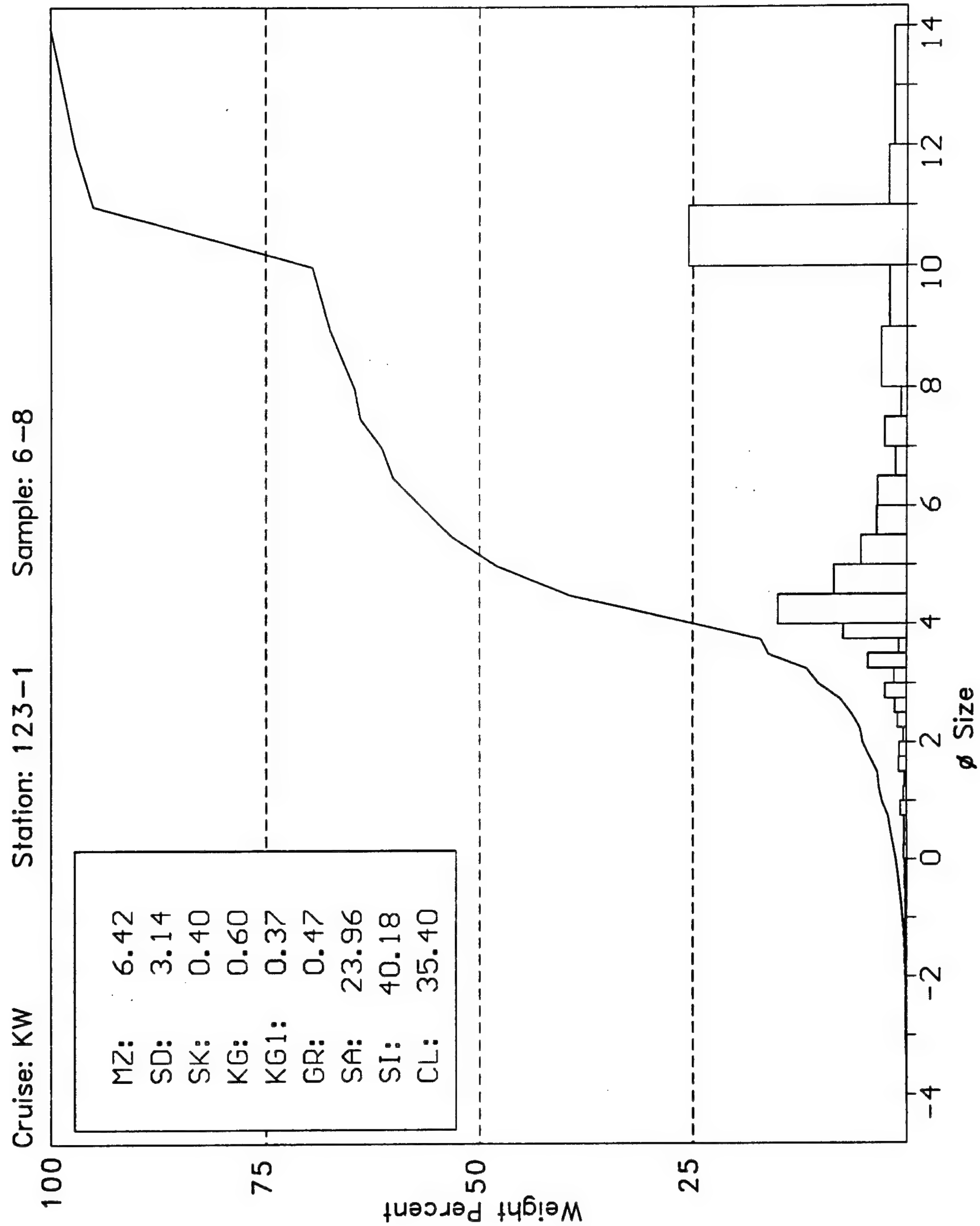


Cruise: KW
Station: 123-1
Sample: 0-2
MZ: 6.63
SD: 3.32
SK: 0.30
KG: 0.64
KG1: 0.39
GR: 0.01
SA: 23.68
SI: 37.61
CL: 38.76
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

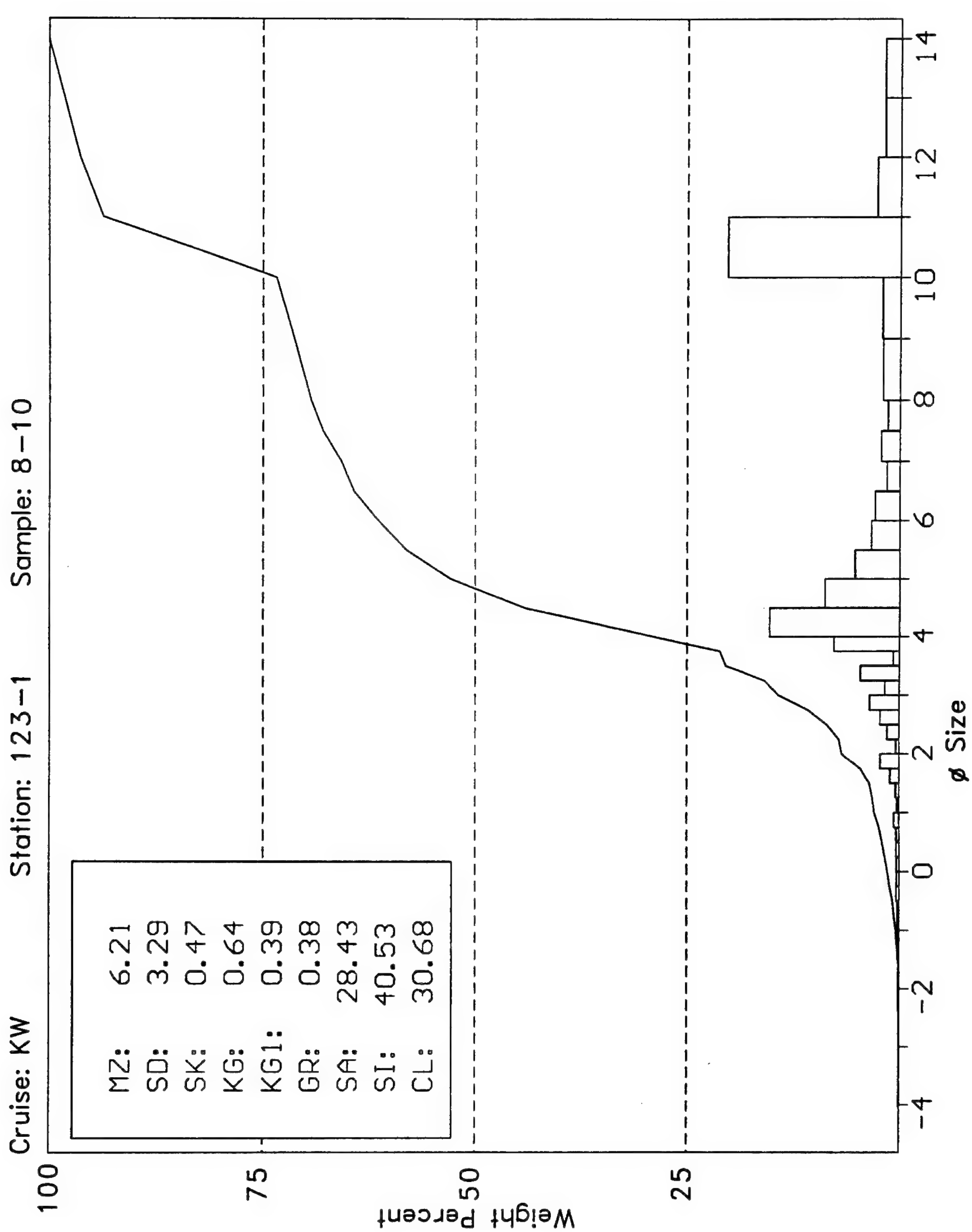

Cruise: KW
Station: 123-1
Sample: 2-4
MZ: 6.43
SD: 3.13
SK: 0.53
KG: 0.60
KG1: 0.38
GR: 0.01
SA: 25.20
SI: 43.78
CL: 30.99
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
φ Size



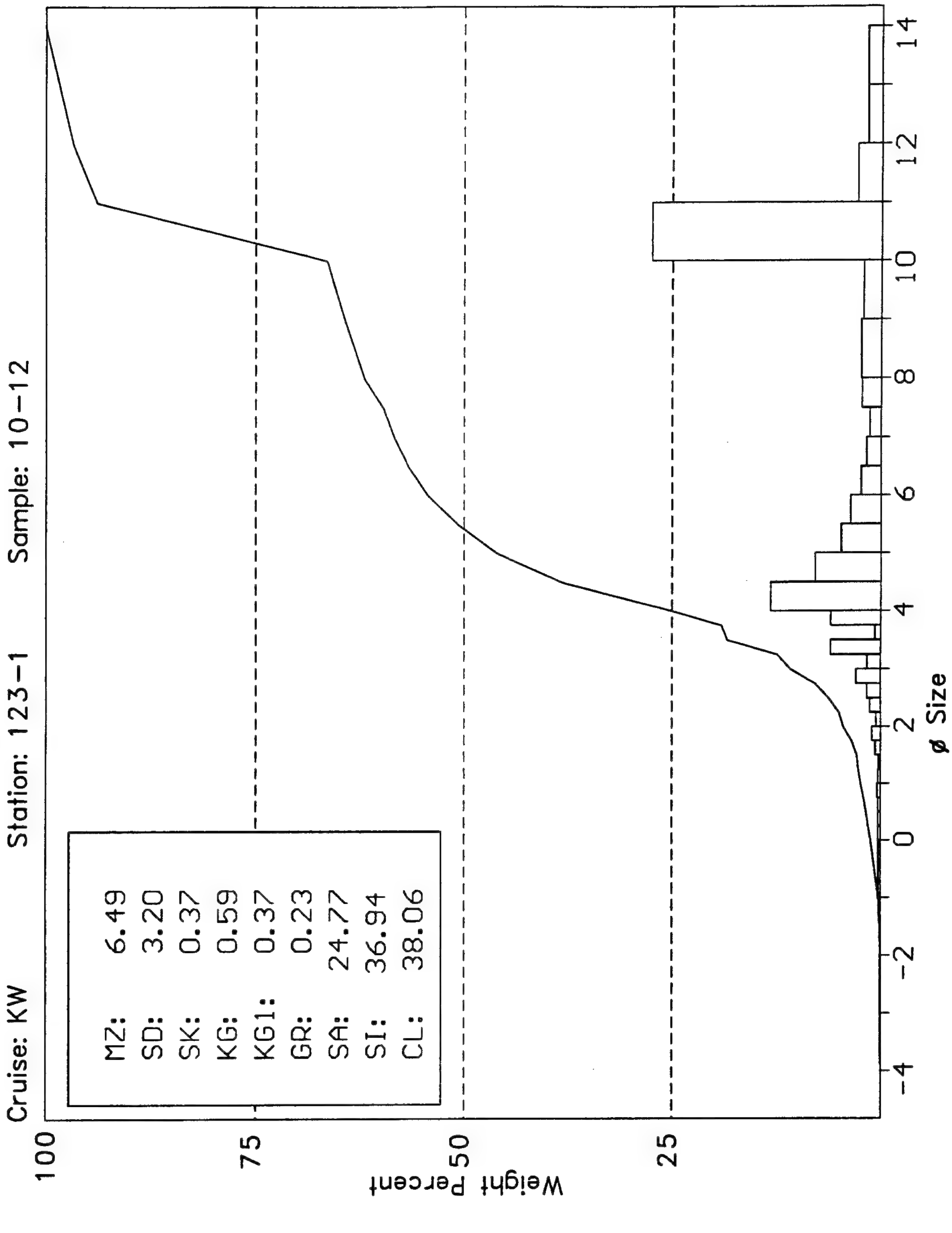
Cruise: KW
Station: 123-1
Sample: 4-6
MZ: 6.54
SD: 3.06
SK: 0.46
KG: 0.58
KG1: 0.37
GR: 0.56
SA: 25.12
SI: 38.45
CL: 35.85
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size



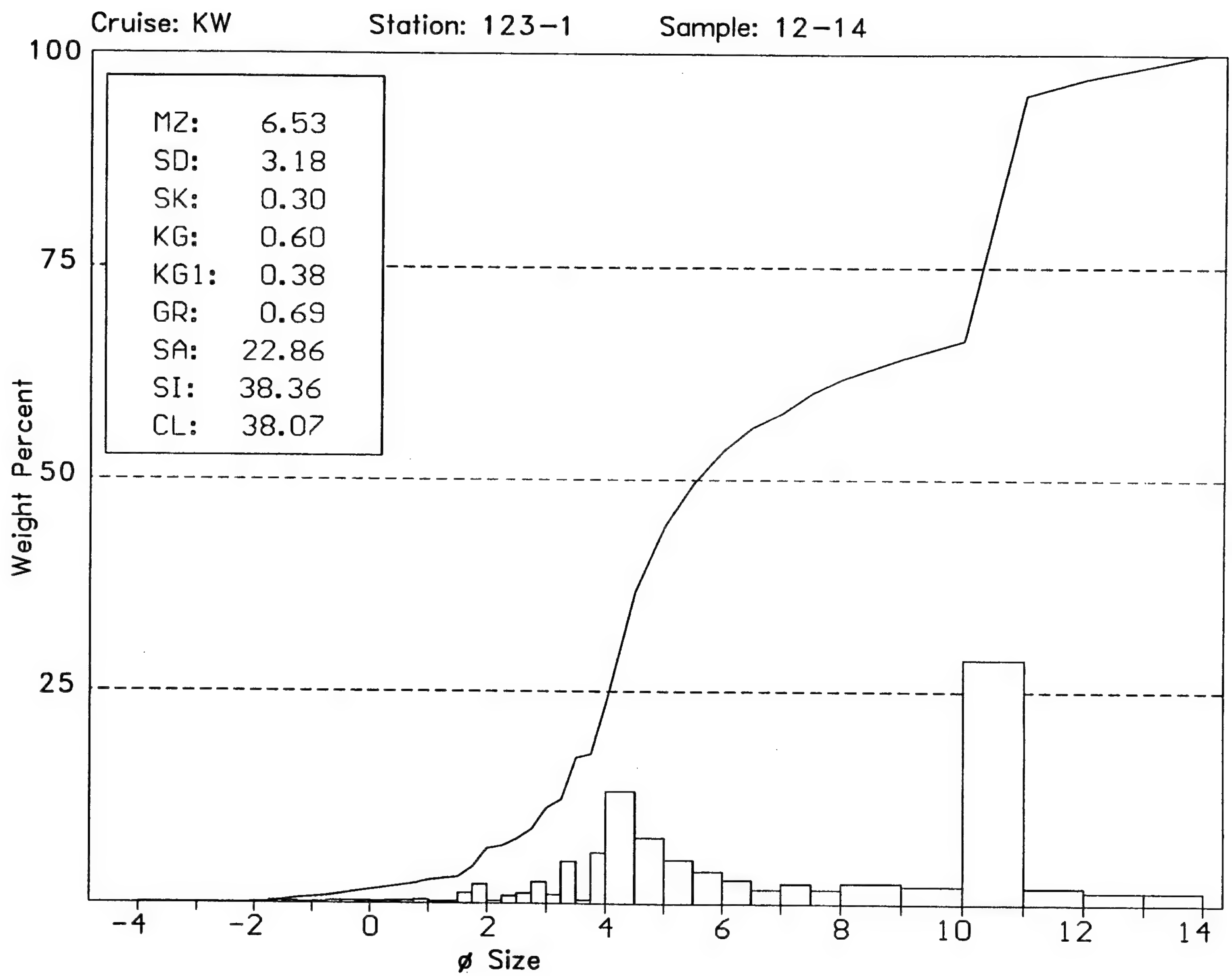
Cruise: KW
Station: 123-1
Sample: 6-8
MZ: 6.42
SD: 3.14
SK: 0.40
KG: 0.60
KG1: 0.37
GR: 0.47
SA: 23.96
SI: 40.18
CL: 35.40
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

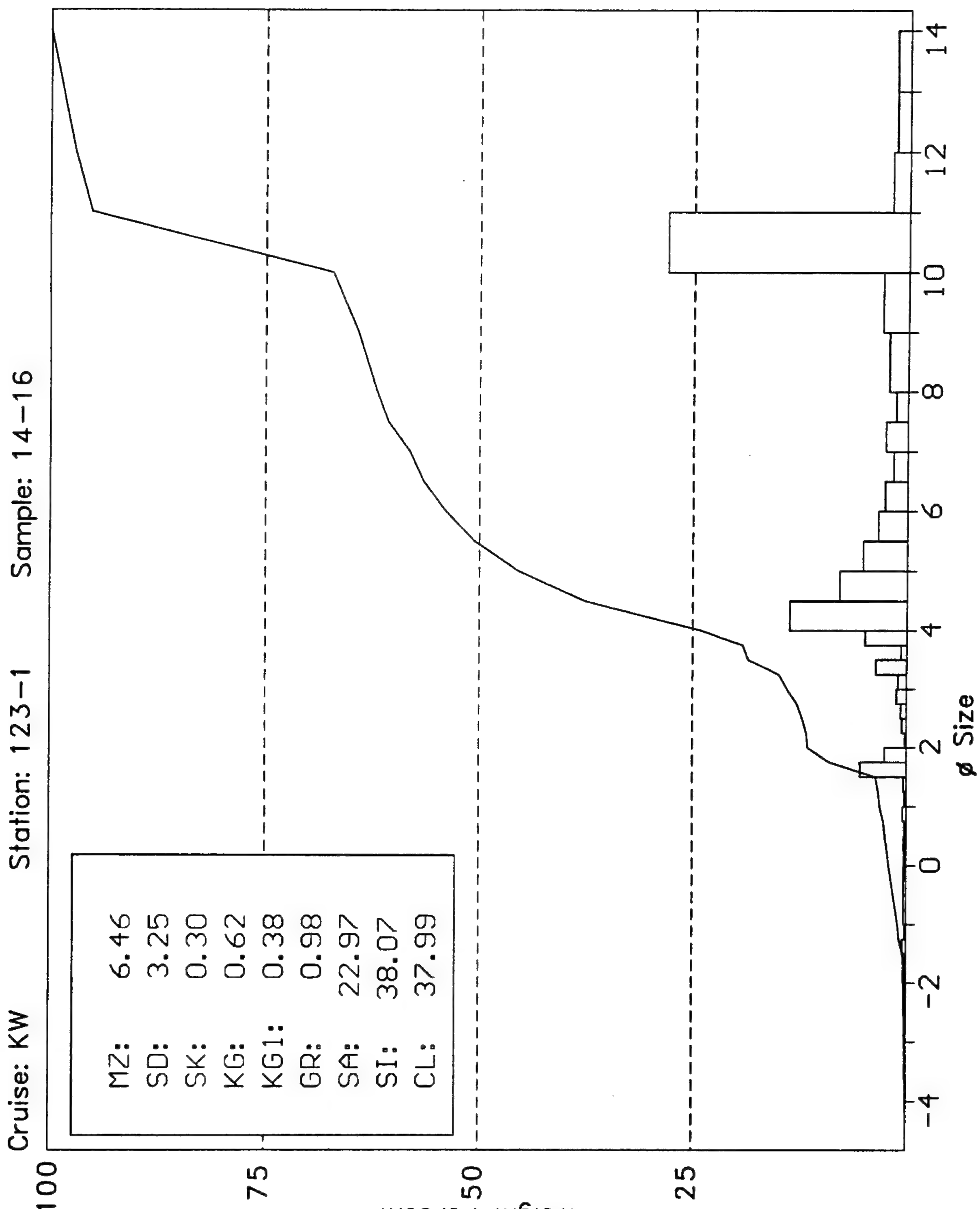


Cruise: KW
Station: 123-1
Sample: 8-10
MZ: 6.21
SD: 3.29
SK: 0.47
KG: 0.64
KG1: 0.39
GR: 0.38
SA: 28.43
SI: 40.53
CL: 30.68
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

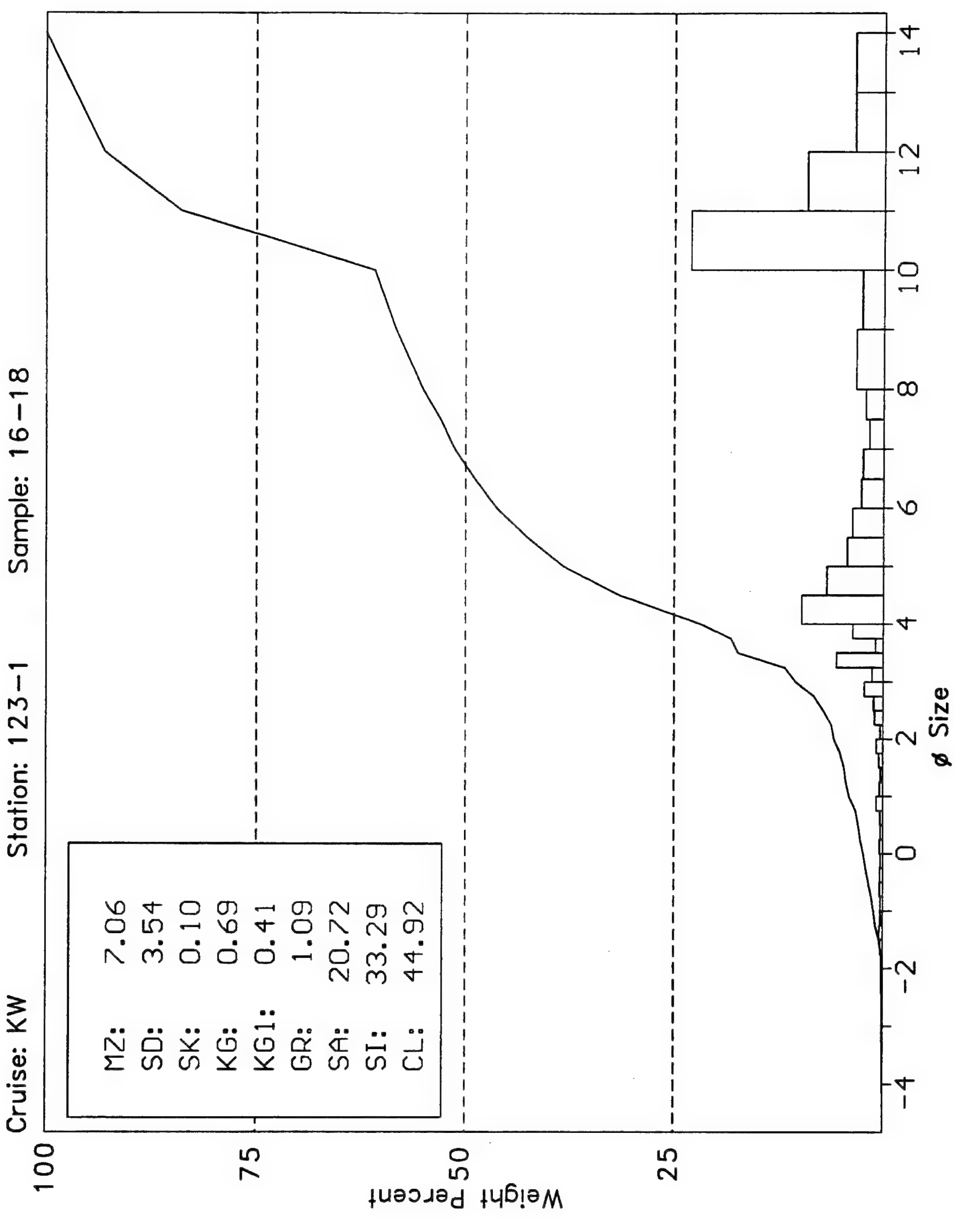


Cruise: KW
Station: 123-1
Sample: 10-12
MZ: 6.49
SD: 3.20
SK: 0.37
KG: 0.59
KG1: 0.37
GR: 0.23
SA: 24.77
SI: 36.94
CL: 38.06
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

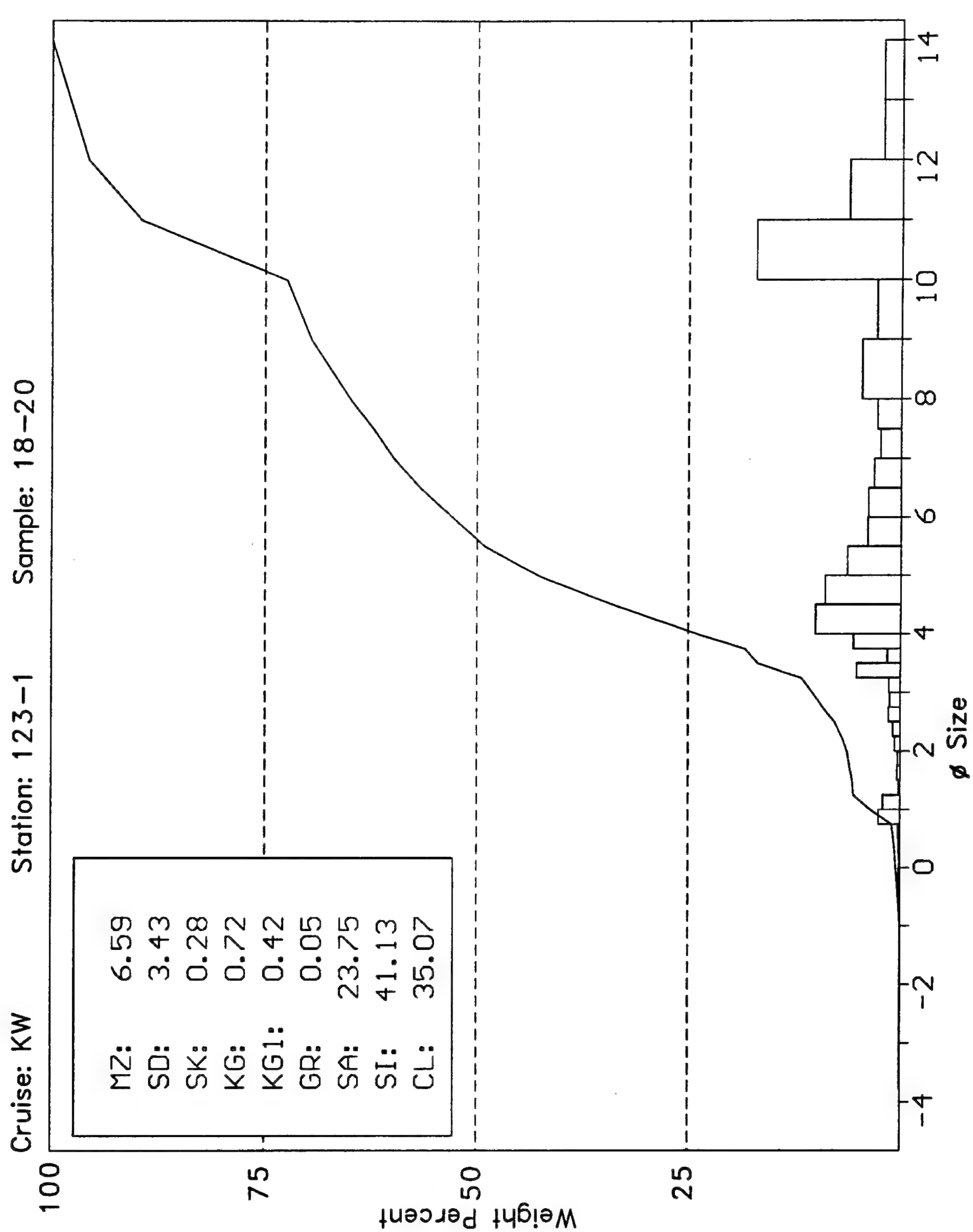

Cruise: KW
Station: 123−1
Sample: 12−14
MZ: 6.53
SD: 3.18
SK: 0.30
KG: 0.60
KG1: 0.38
GR: 0.69
SA: 22.86
SI: 38.36
CL: 38.07
Weight Percent
100
75
50
25
−4
−2
0
2
4
6
8
10
12
14
ø Size



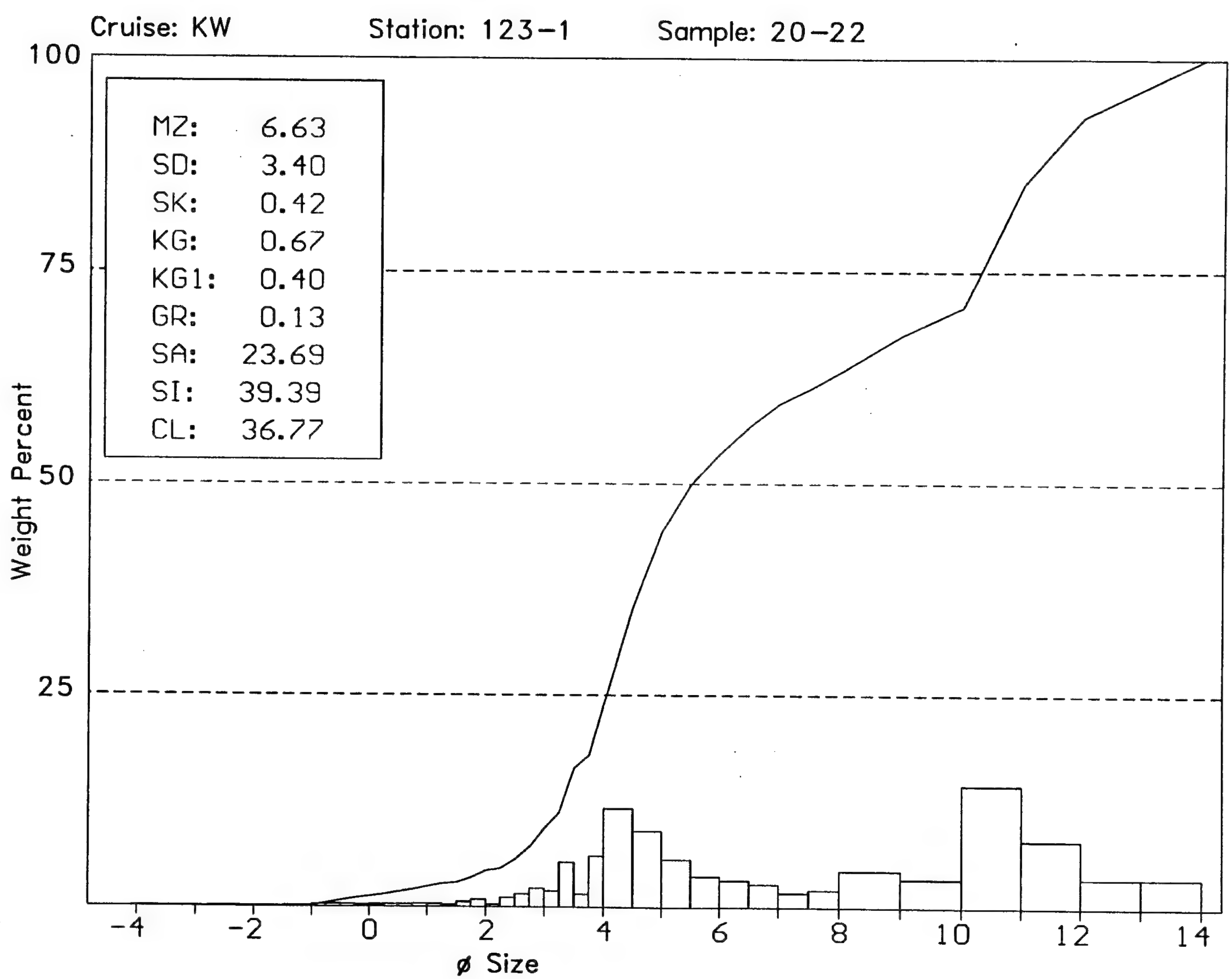
Cruise: KW
Station: 123-1
Sample: 14-16
MZ: 6.46
SD: 3.25
SK: 0.30
KG: 0.62
KG1: 0.38
GR: 0.98
SA: 22.97
SI: 38.07
CL: 37.99
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

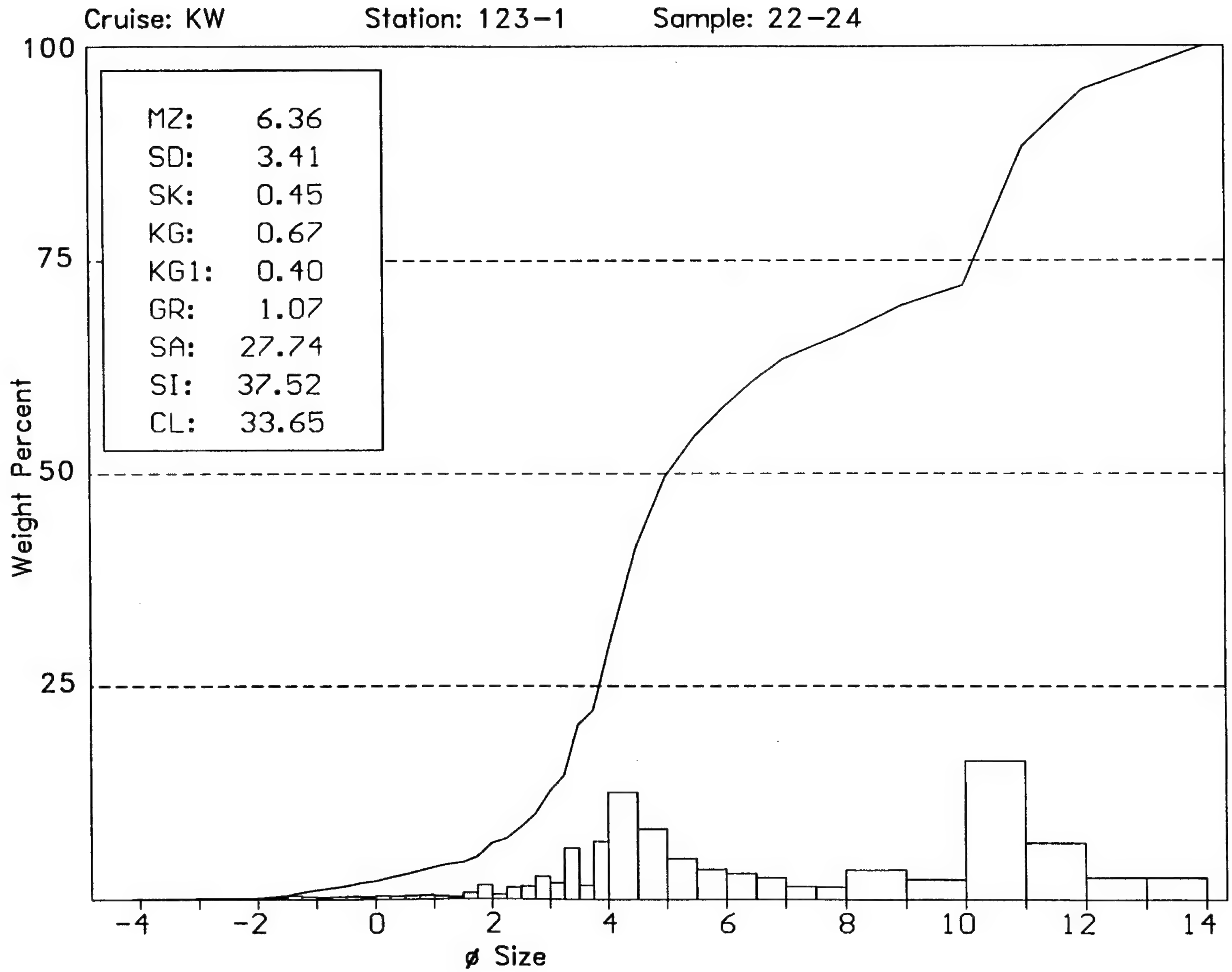


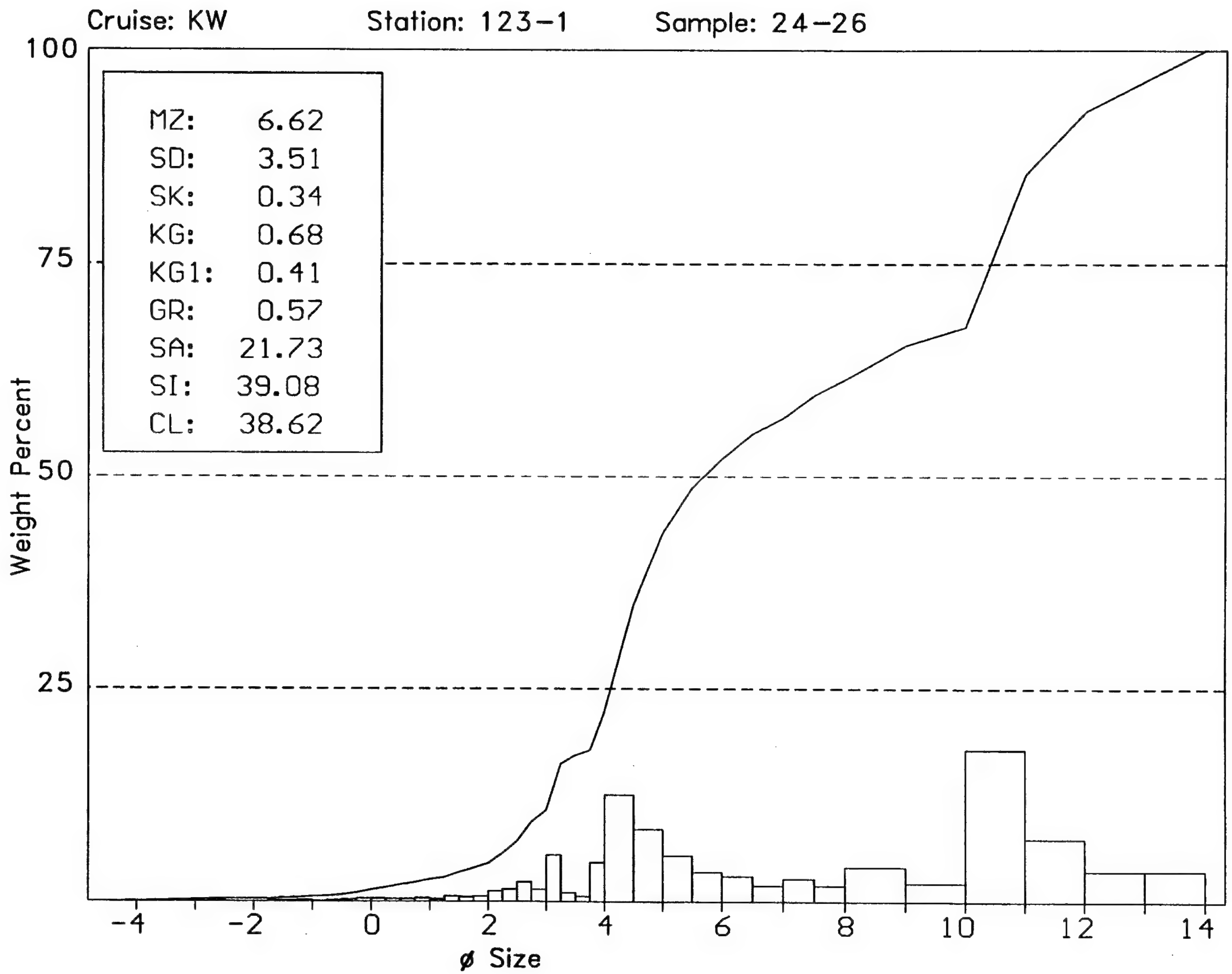
Cruise: KW
Station: 123-1
Sample: 16-18
MZ: 7.06
SD: 3.54
SK: 0.10
KG: 0.69
KG1: 0.41
GR: 1.09
SA: 20.72
SI: 33.29
CL: 44.92
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ϕ Size

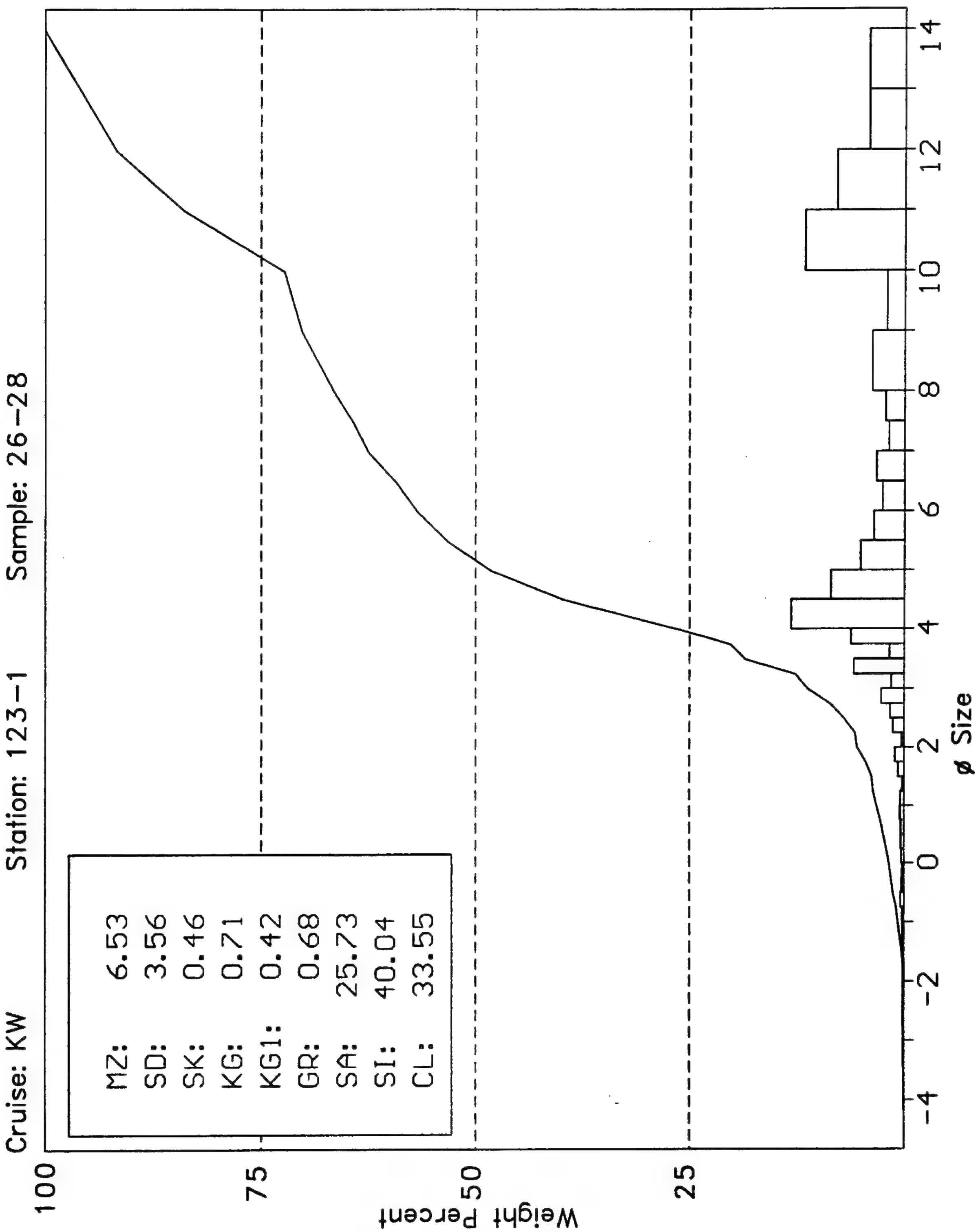


Cruise: KW
Station: 123-1
Sample: 18-20
MZ: 6.59
SD: 3.43
SK: 0.28
KG: 0.72
KG1: 0.42
GR: 0.05
SA: 23.75
SI: 41.13
CL: 35.07
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

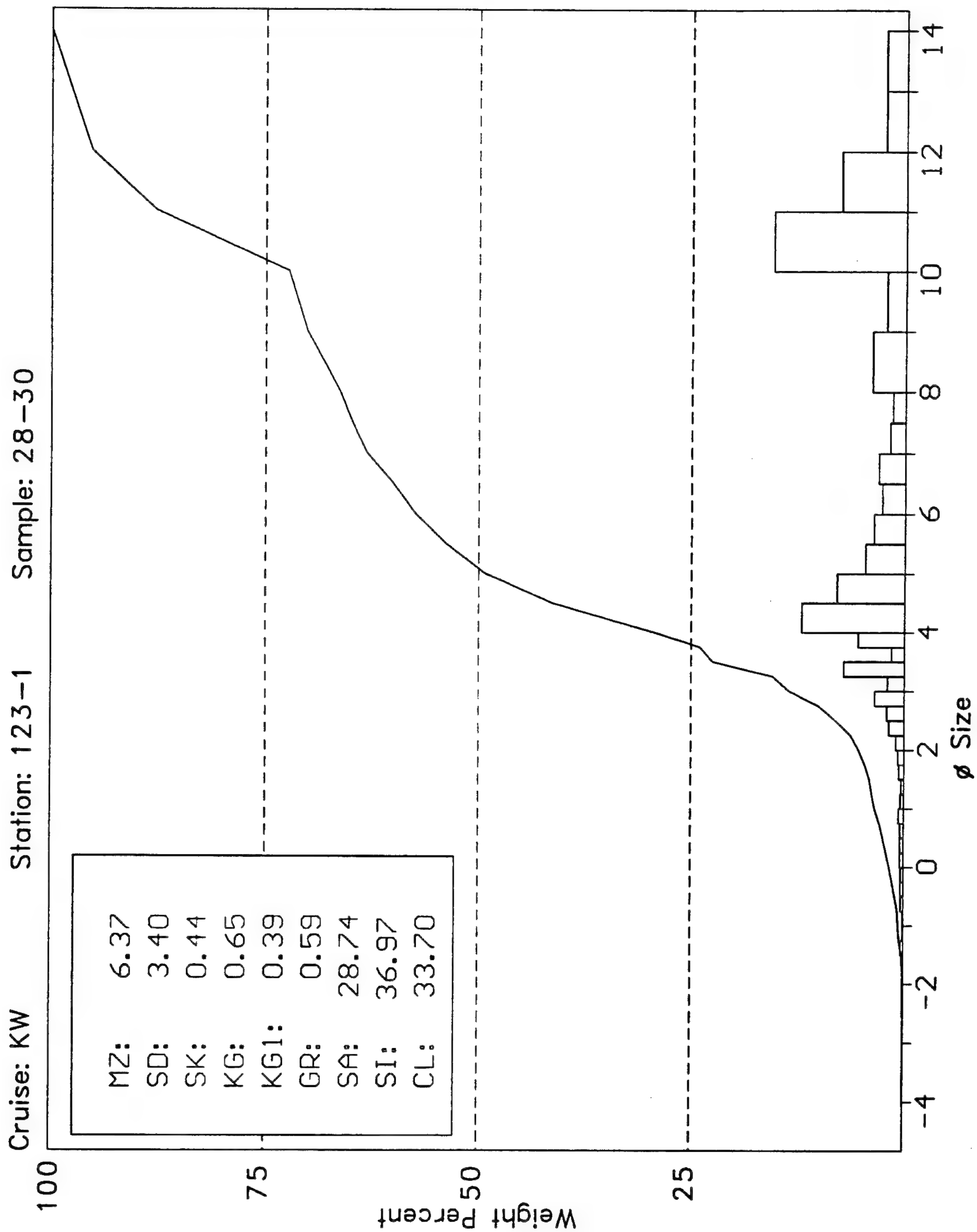

Cruise: KW
Station: 123-1
Sample: 20-22
MZ: 6.63
SD: 3.40
SK: 0.42
KG: 0.67
KG1: 0.40
GR: 0.13
SA: 23.69
SI: 39.39
CL: 36.77
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

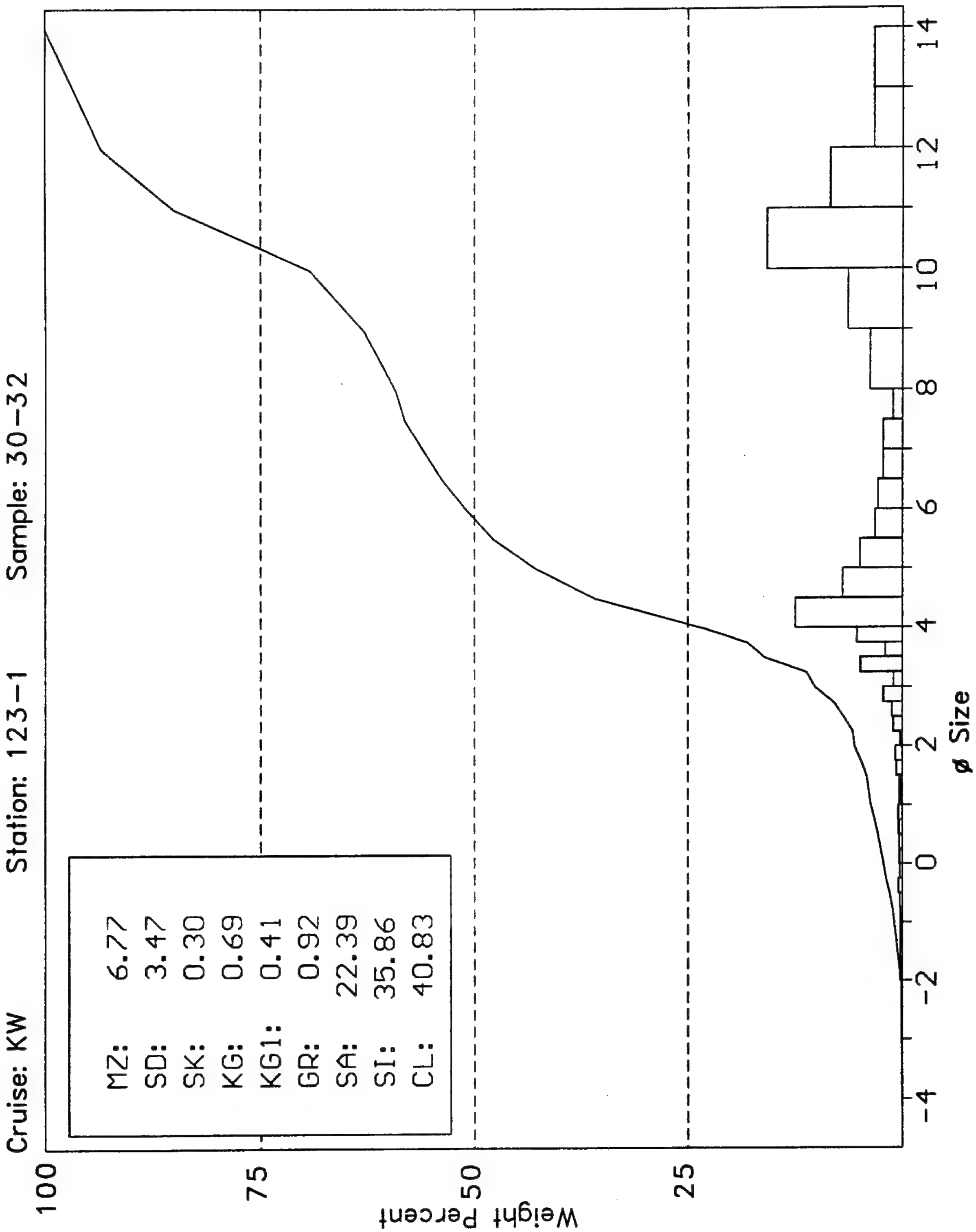

Cruise: KW
Station: 123-1
Sample: 22-24
MZ: 6.36
SD: 3.41
SK: 0.45
KG: 0.67
KG1: 0.40
GR: 1.07
SA: 27.74
SI: 37.52
CL: 33.65
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

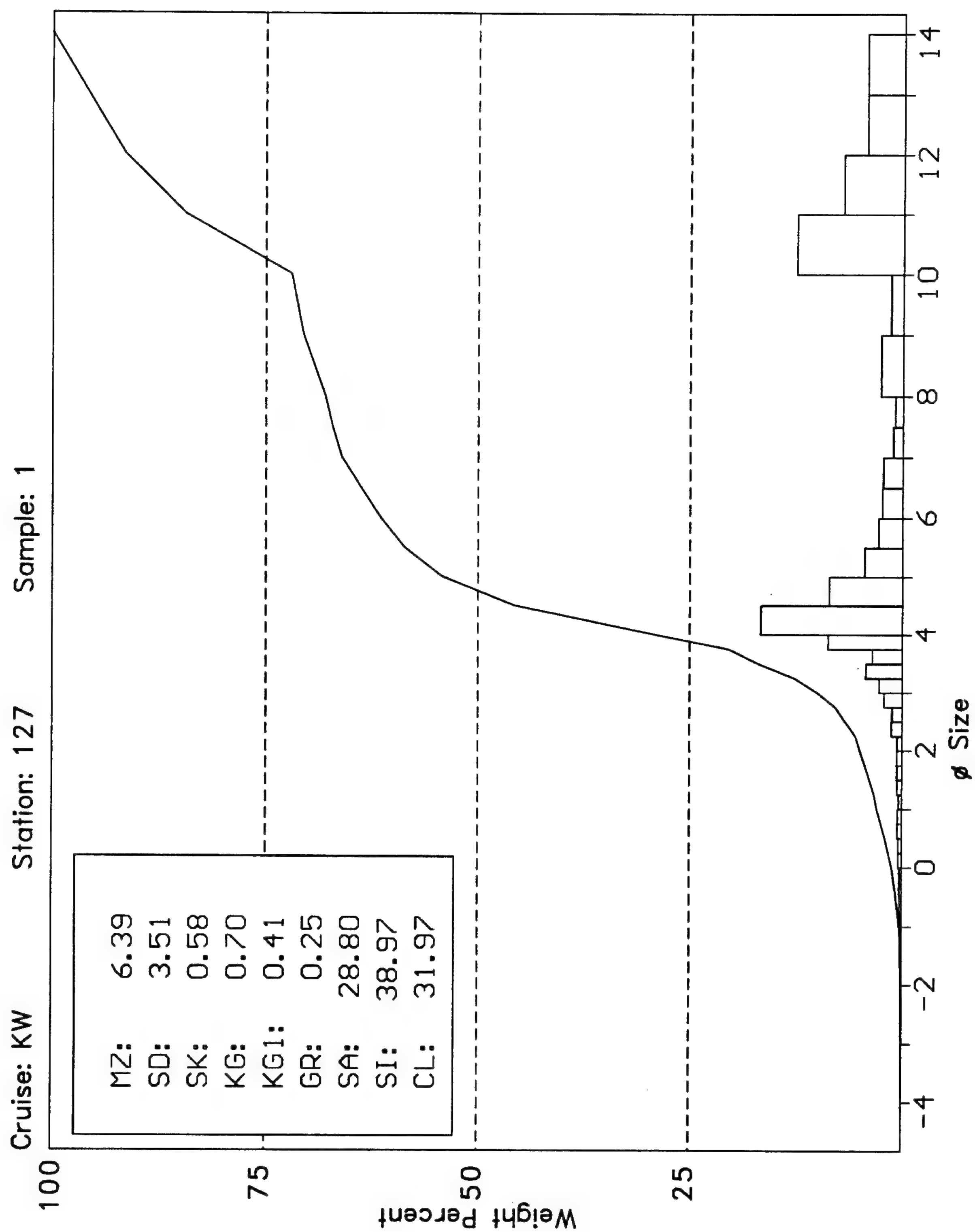

Cruise: KW
Station: 123-1
Sample: 24-26
MZ: 6.62
SD: 3.51
SK: 0.34
KG: 0.68
KG1: 0.41
GR: 0.57
SA: 21.73
SI: 39.08
CL: 38.62
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

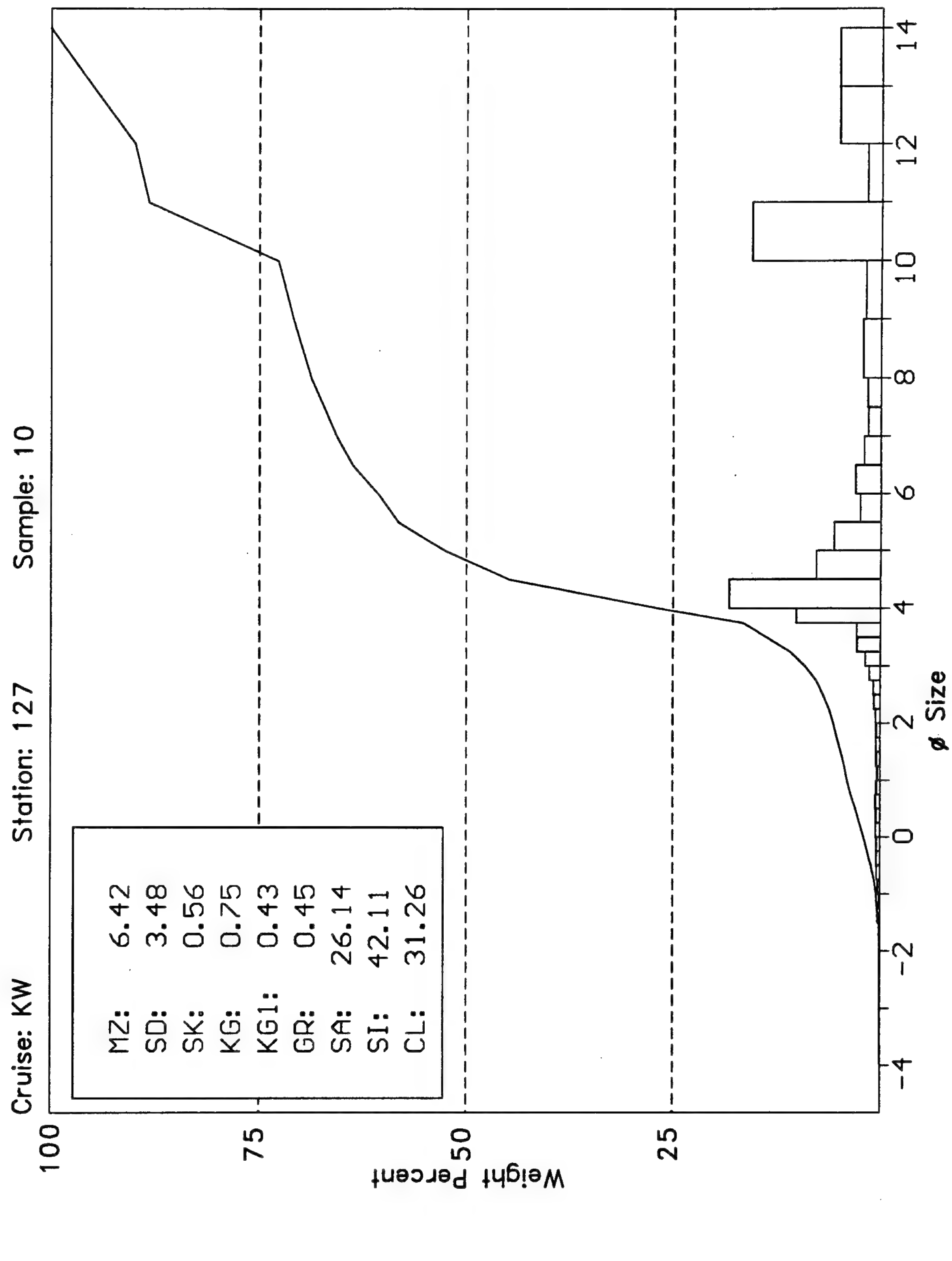


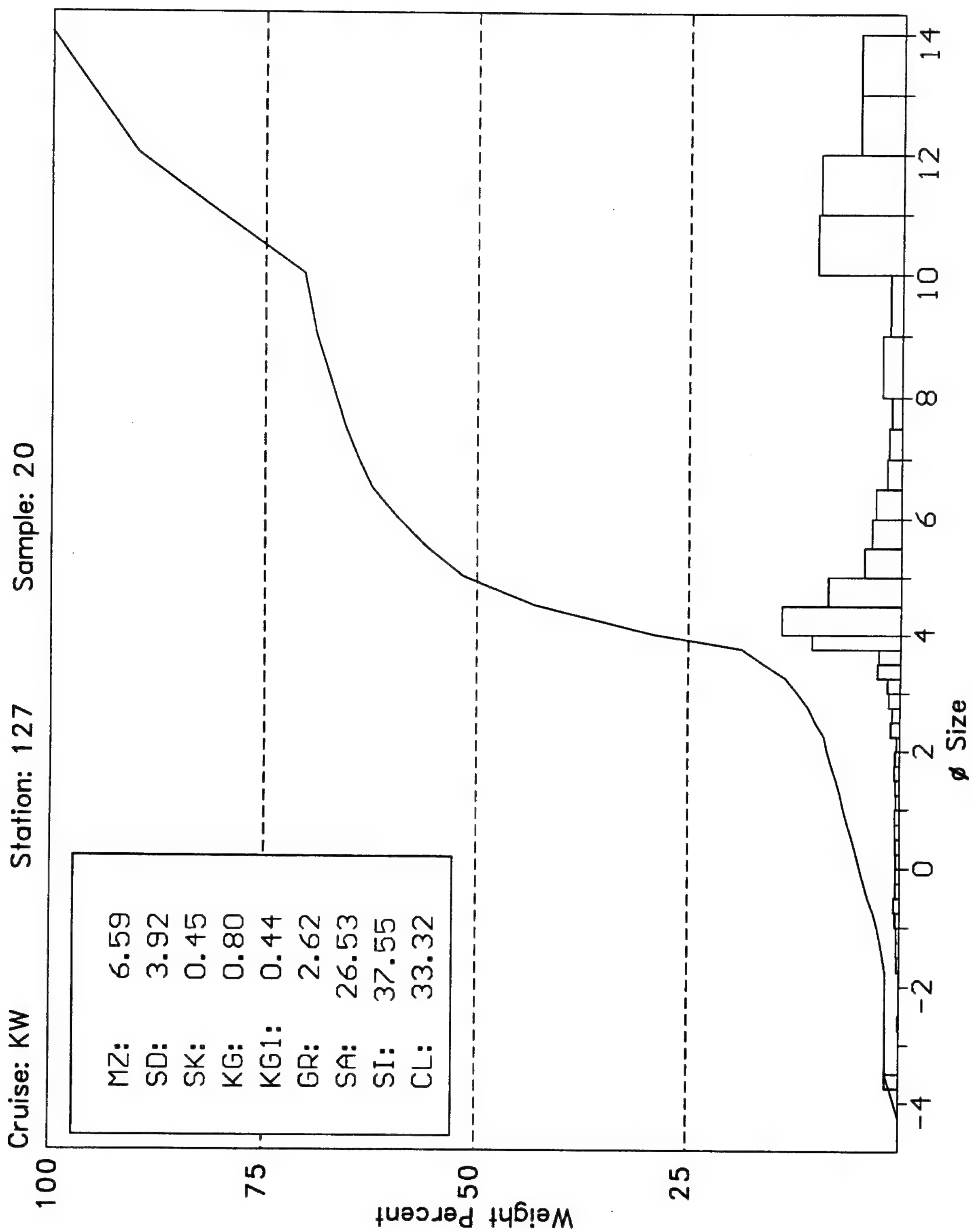
Cruise: KW
Station: 123-1
Sample: 26-28
MZ: 6.53
SD: 3.56
SK: 0.46
KG: 0.71
KG1: 0.42
GR: 0.68
SA: 25.73
SI: 40.04
CL: 33.55
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size


Cruise: KW
Station: 123-1
Sample: 28-30
MZ: 6.37
SD: 3.40
SK: 0.44
KG: 0.65
KG1: 0.39
GR: 0.59
SA: 28.74
SI: 36.97
CL: 33.70
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

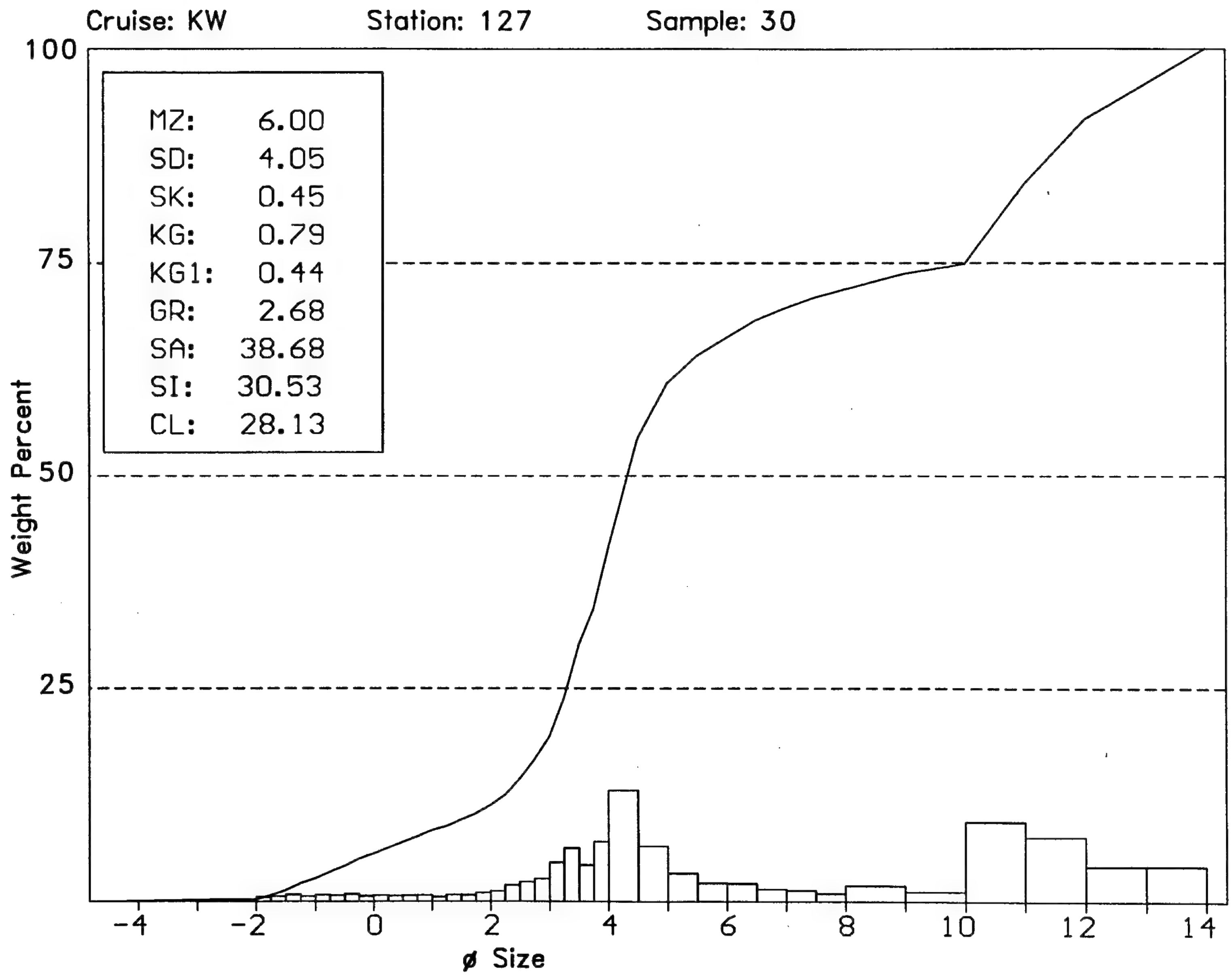

Cruise: KW
Station: 123-1
Sample: 30-32
MZ: 6.77
SD: 3.47
SK: 0.30
KG: 0.69
KG1: 0.41
GR: 0.92
SA: 22.39
SI: 35.86
CL: 40.83
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14


Cruise: KW
Station: 127
Sample: 1
MZ: 6.39
SD: 3.51
SK: 0.58
KG: 0.70
KG1: 0.41
GR: 0.25
SA: 28.80
SI: 38.97
CL: 31.97
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

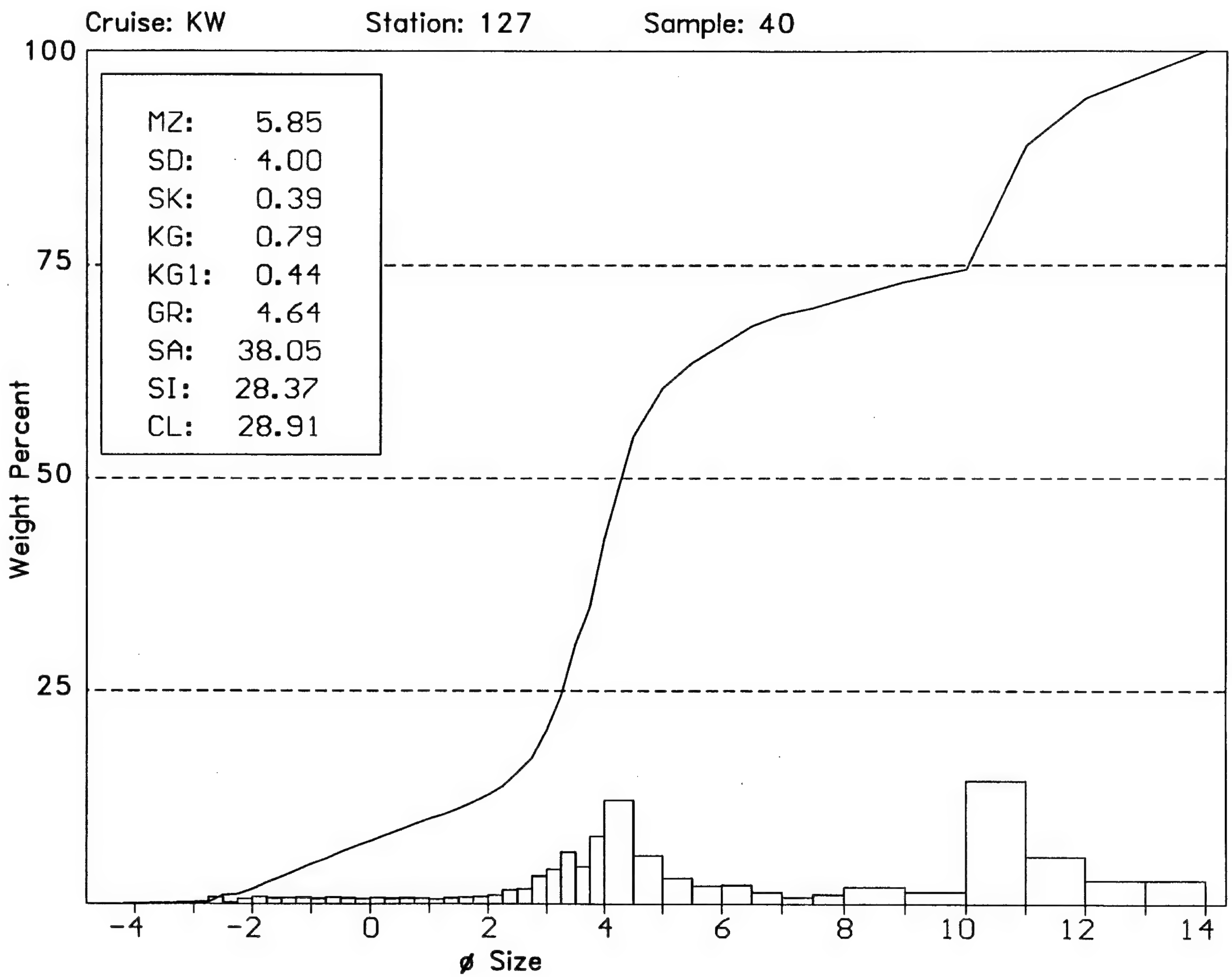

Cruise: KW
Station: 127
Sample: 10
MZ: 6.42
SD: 3.48
SK: 0.56
KG: 0.75
KG1: 0.43
GR: 0.45
SA: 26.14
SI: 42.11
CL: 31.26
Weight Percent
100
75
50
25
ϕ Size
-4
-2
0
2
4
6
8
10
12
14



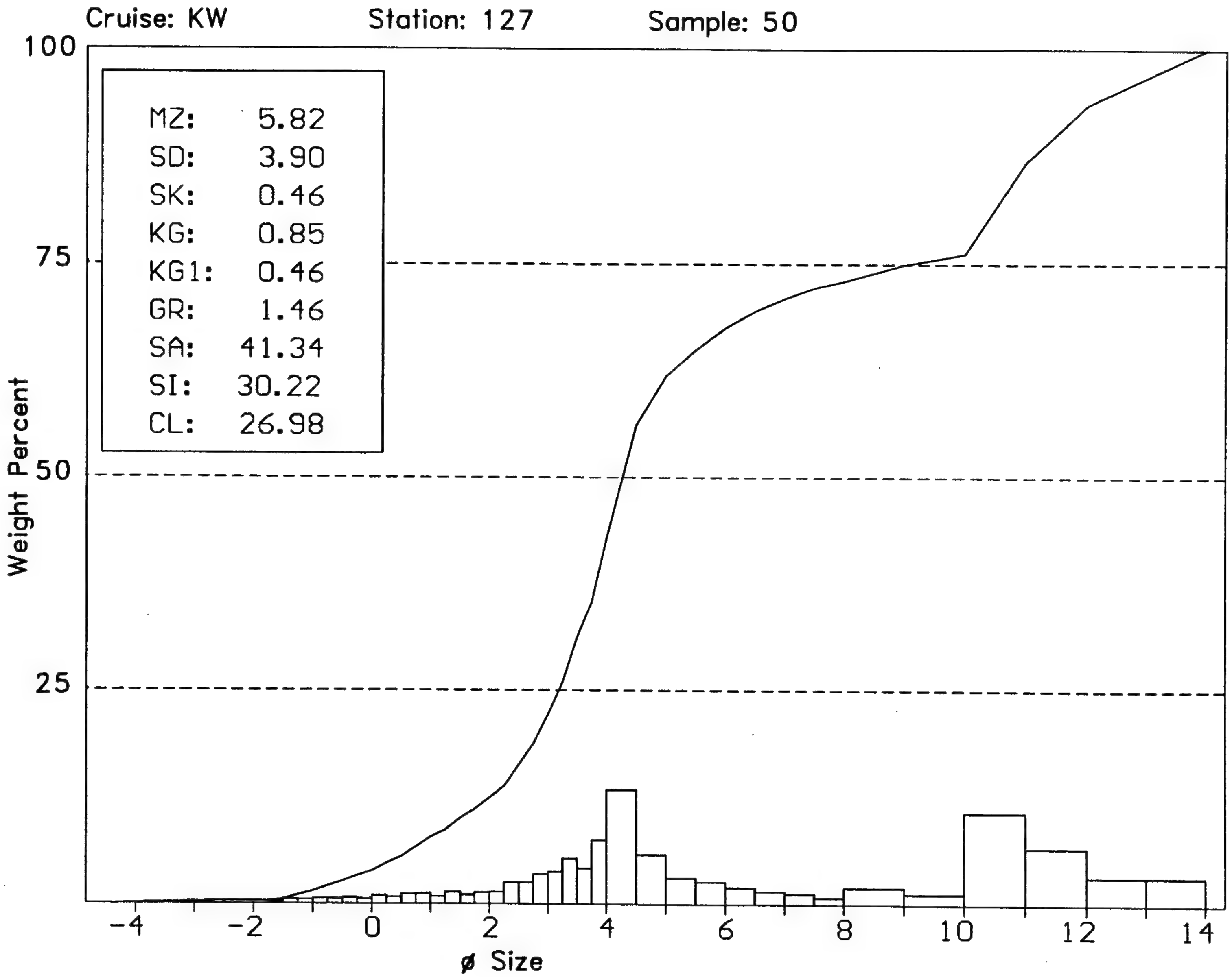
Cruise: KW
Station: 127
Sample: 20
MZ: 6.59
SD: 3.92
SK: 0.45
KG: 0.80
KG1: 0.44
GR: 2.62
SA: 26.53
SI: 37.55
CL: 33.32
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size



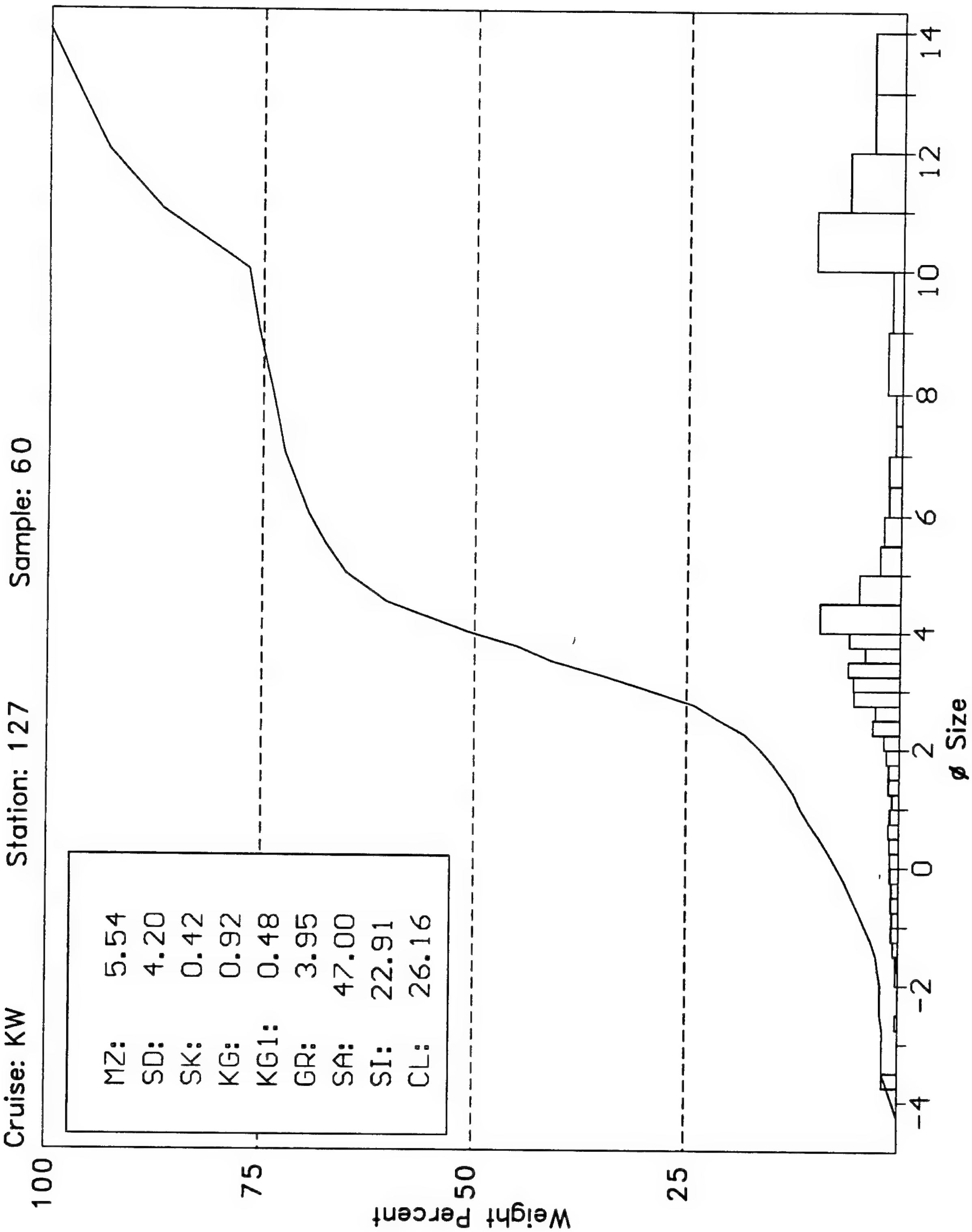
Cruise: KW
Station: 127
Sample: 30
MZ: 6.00
SD: 4.05
SK: 0.45
KG: 0.79
KG1: 0.44
GR: 2.68
SA: 38.68
SI: 30.53
CL: 28.13
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

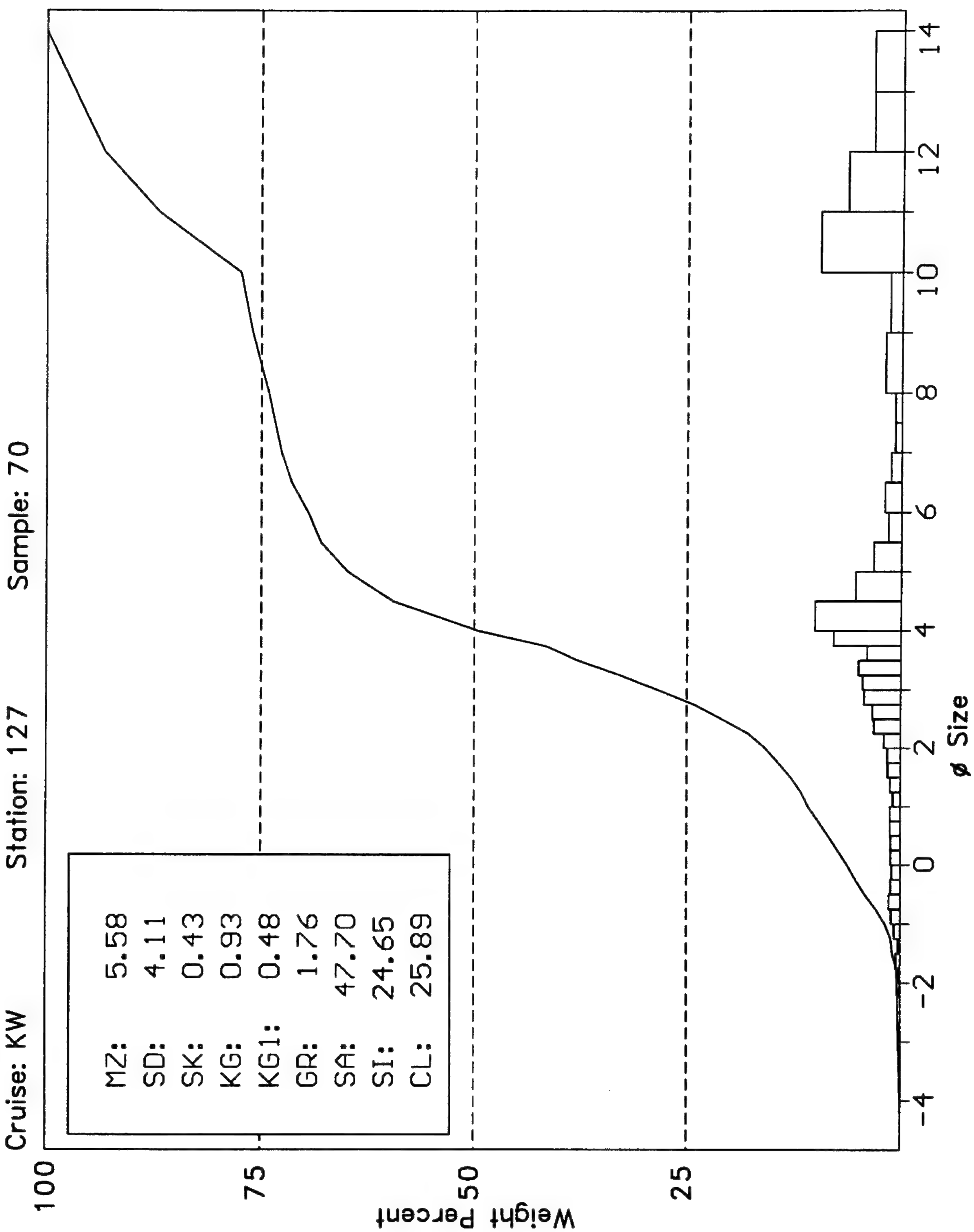


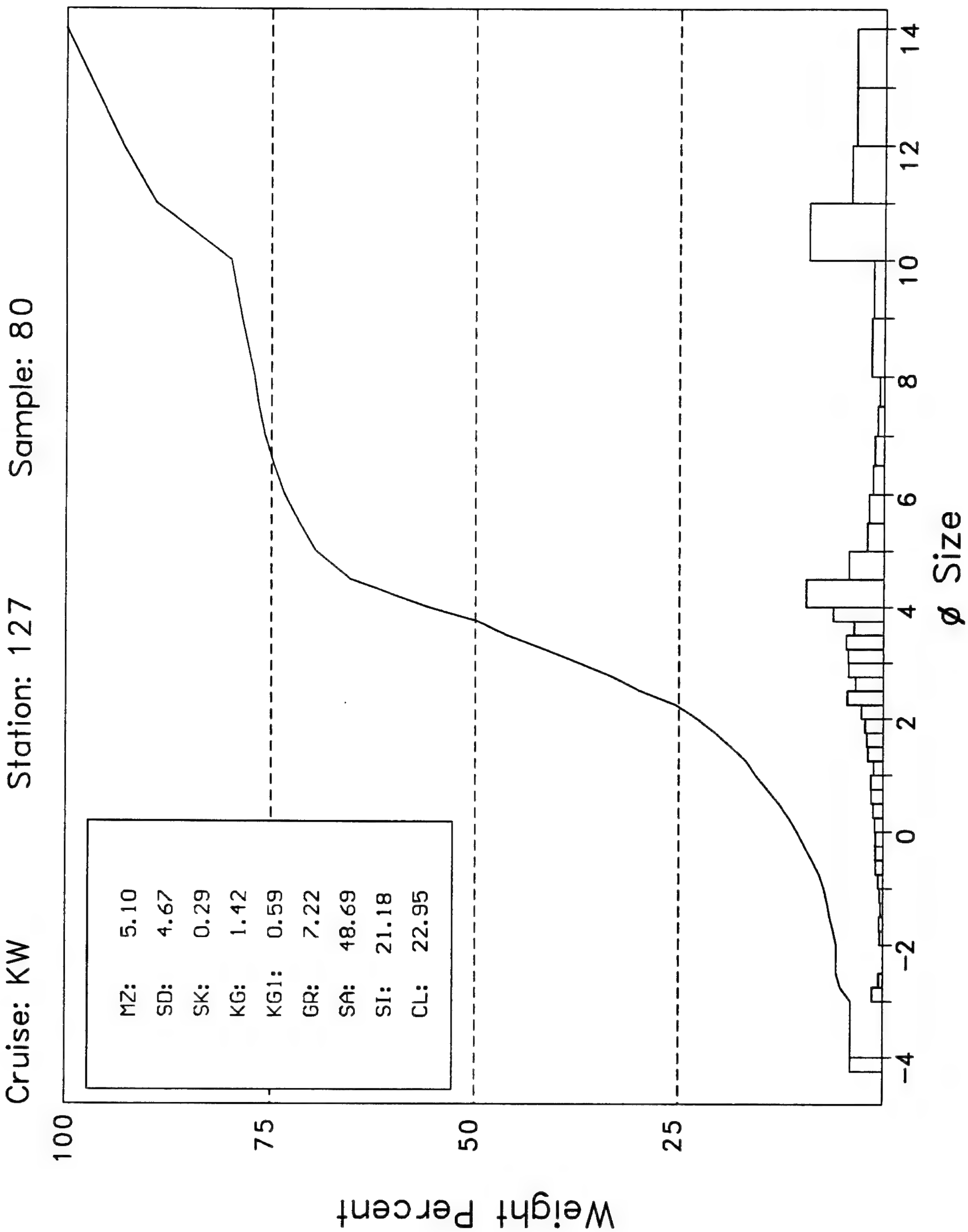
Cruise: KW
Station: 127
Sample: 40
MZ: 5.85
SD: 4.00
SK: 0.39
KG: 0.79
KG1: 0.44
GR: 4.64
SA: 38.05
SI: 28.37
CL: 28.91
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size



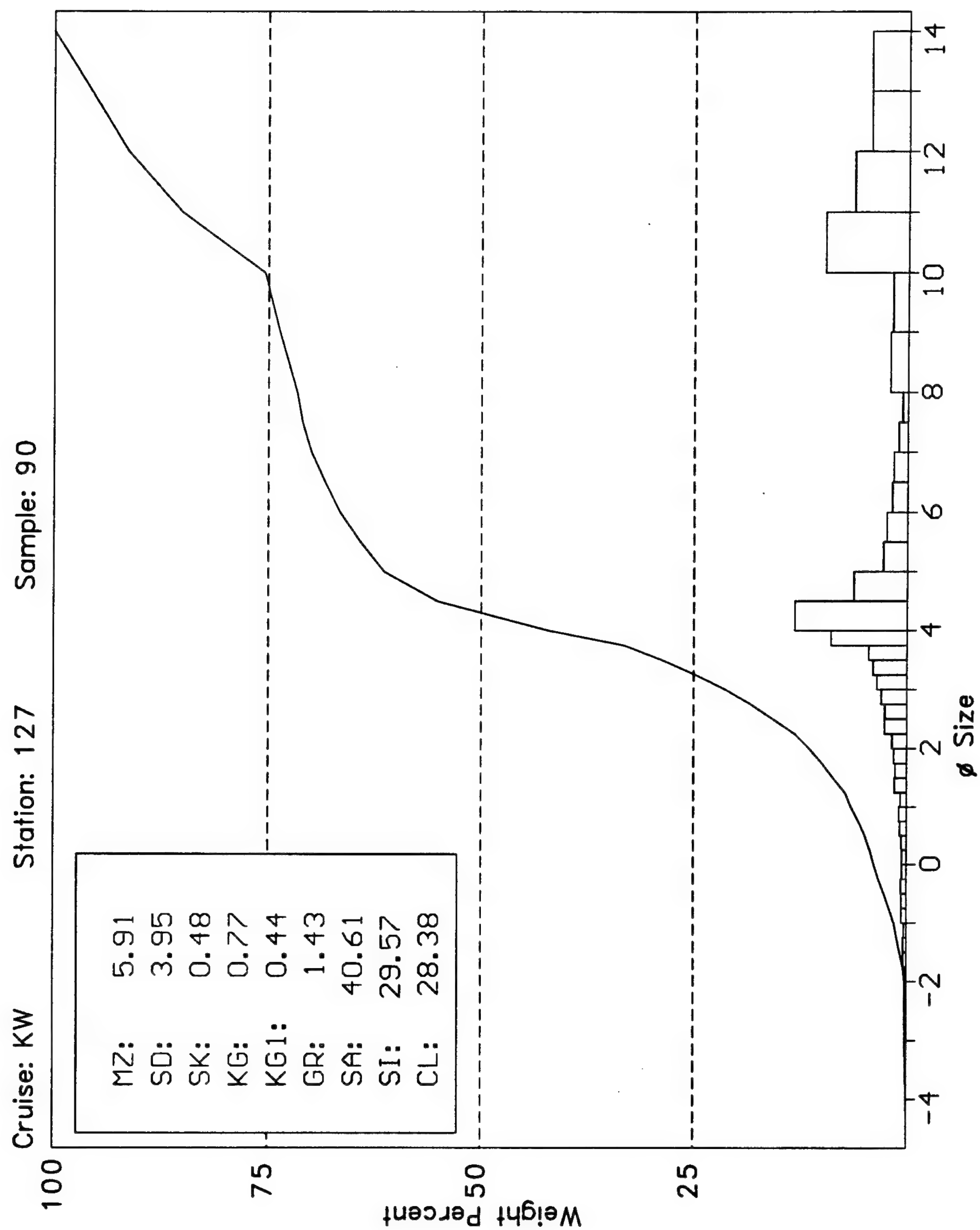
Cruise: KW
Station: 127
Sample: 50
MZ: 5.82
SD: 3.90
SK: 0.46
KG: 0.85
KG1: 0.46
GR: 1.46
SA: 41.34
SI: 30.22
CL: 26.98
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

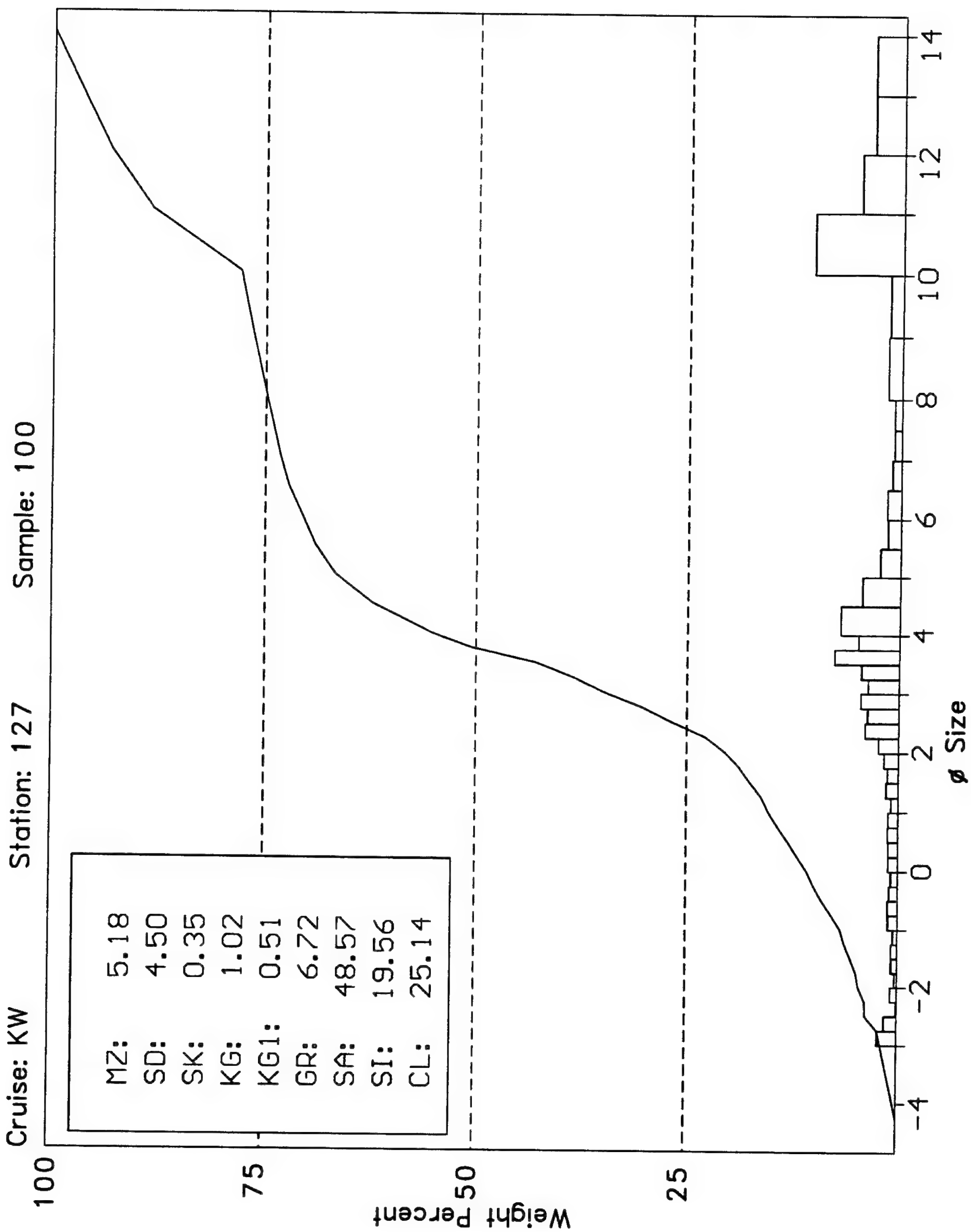

Cruise: KW
Station: 127
Sample: 60
MZ: 5.54
SD: 4.20
SK: 0.42
KG: 0.92
KG1: 0.48
GR: 3.95
SA: 47.00
SI: 22.91
CL: 26.16
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

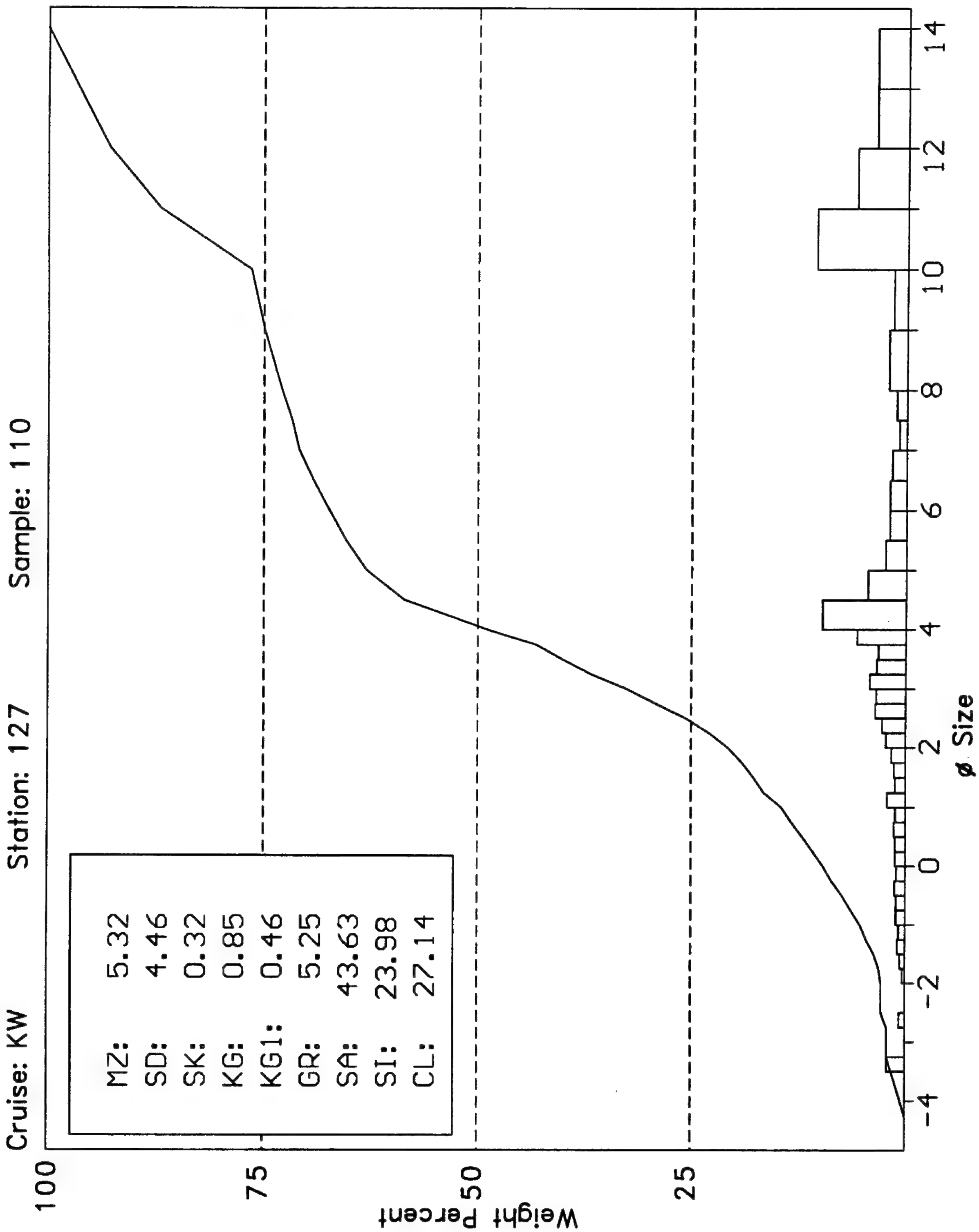

Cruise: KW
Station: 127
Sample: 70
MZ: 5.58
SD: 4.11
SK: 0.43
KG: 0.93
KG1: 0.48
GR: 1.76
SA: 47.70
SI: 24.65
CL: 25.89
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size



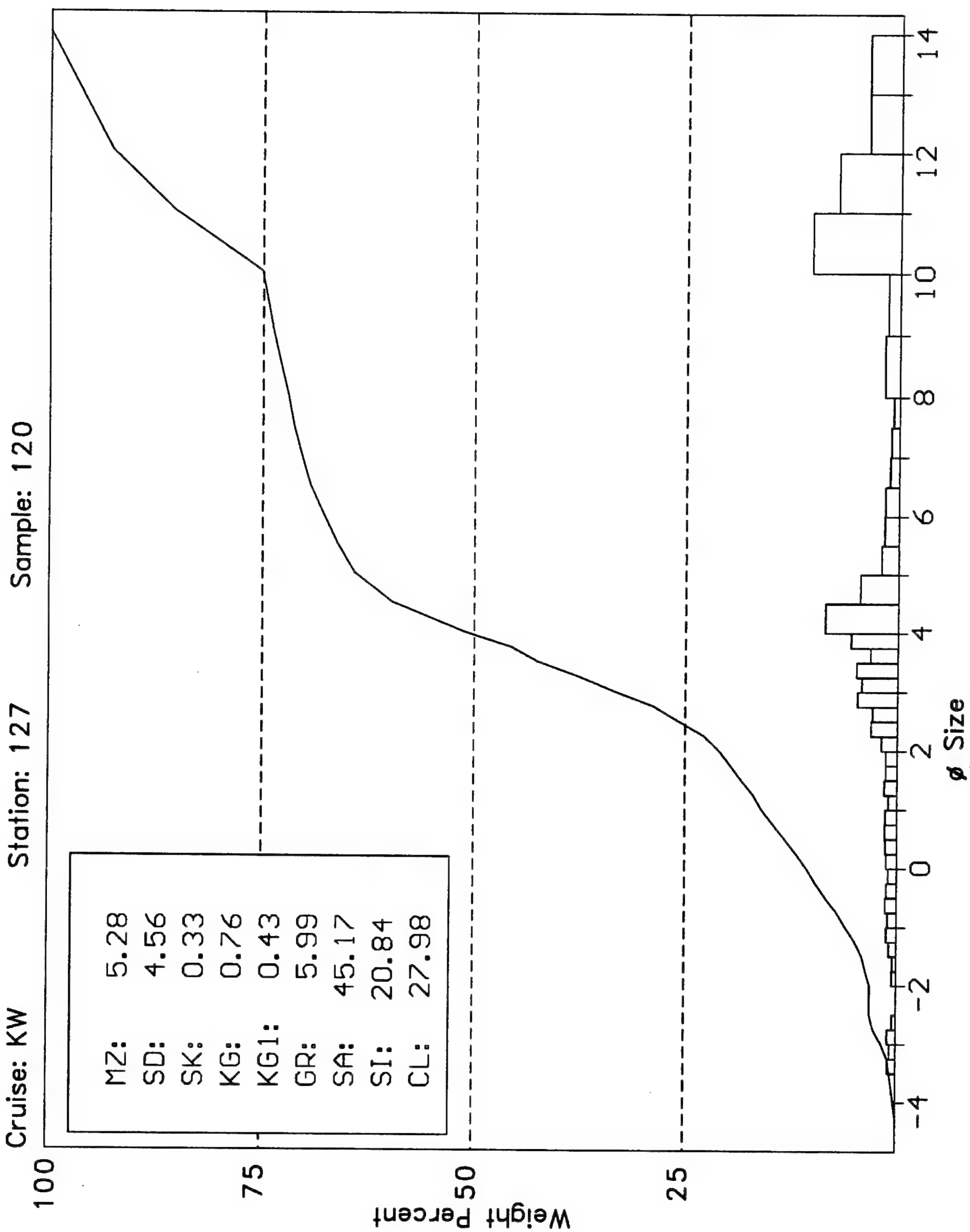
Cruise: KW
Station: 127
Sample: 80
MZ: 5.10
SD: 4.67
SK: 0.29
KG: 1.42
KG1: 0.59
GR: 7.22
SA: 48.69
SI: 21.18
CL: 22.95
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

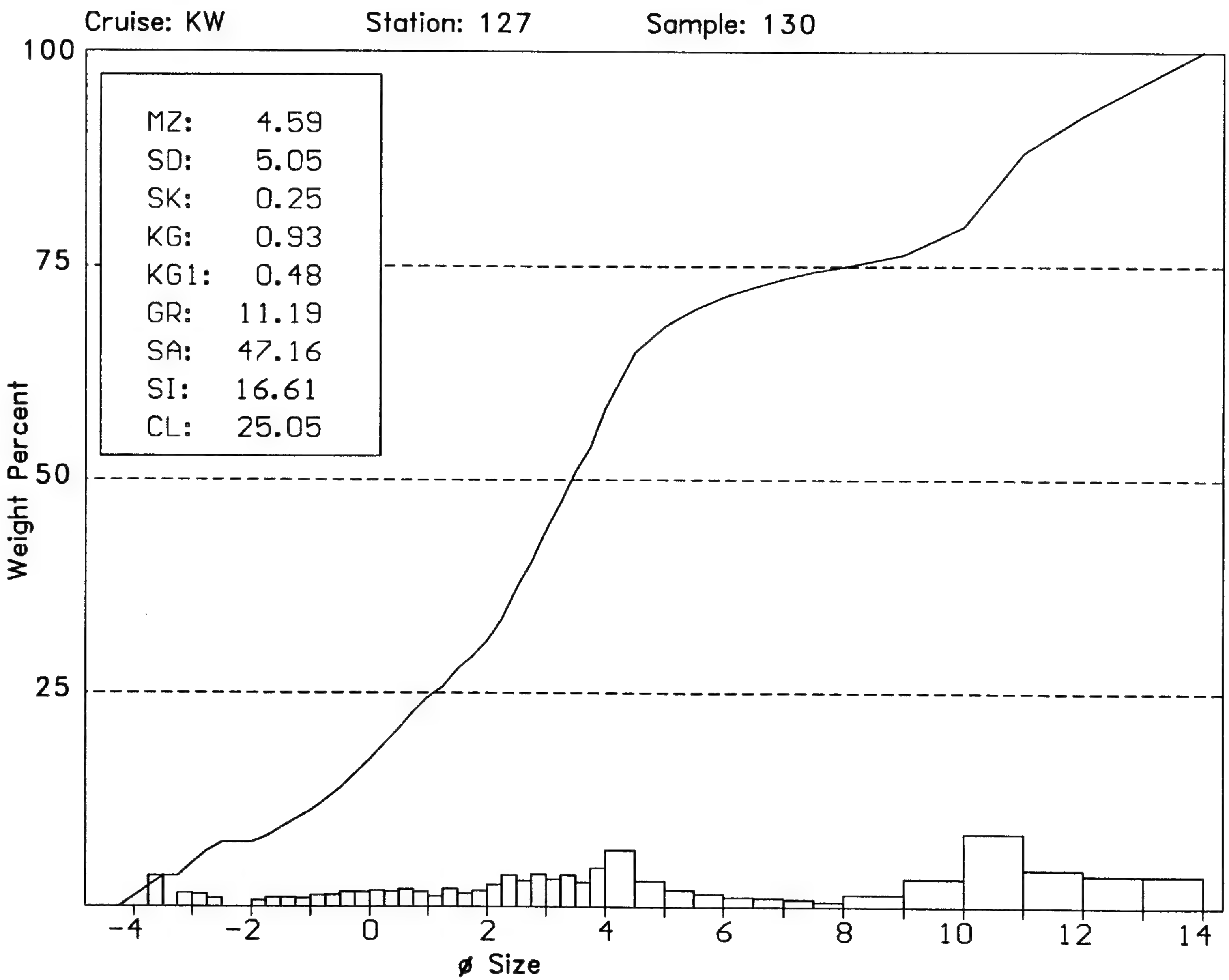

Cruise: KW
Station: 127
Sample: 90
MZ: 5.91
SD: 3.95
SK: 0.48
KG: 0.77
KG1: 0.44
GR: 1.43
SA: 40.61
SI: 29.57
CL: 28.38
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size


Cruise: KW
Station: 127
Sample: 100
MZ: 5.18
SD: 4.50
SK: 0.35
KG: 1.02
KG1: 0.51
GR: 6.72
SA: 48.57
SI: 19.56
CL: 25.14
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

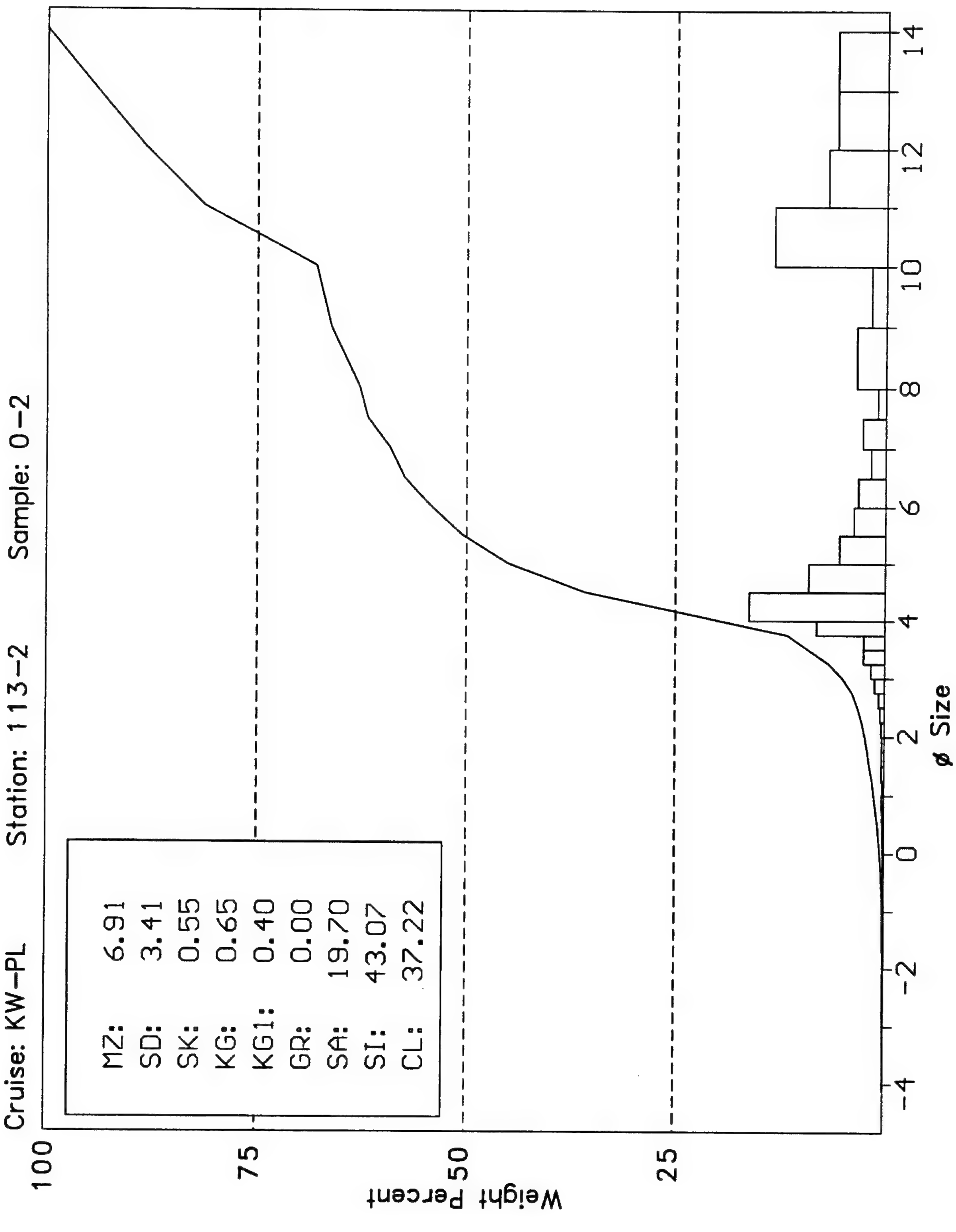


Cruise: KW
Station: 127
Sample: 110
MZ: 5.32
SD: 4.46
SK: 0.32
KG: 0.85
KG1: 0.46
GR: 5.25
SA: 43.63
SI: 23.98
CL: 27.14
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ϕ Size

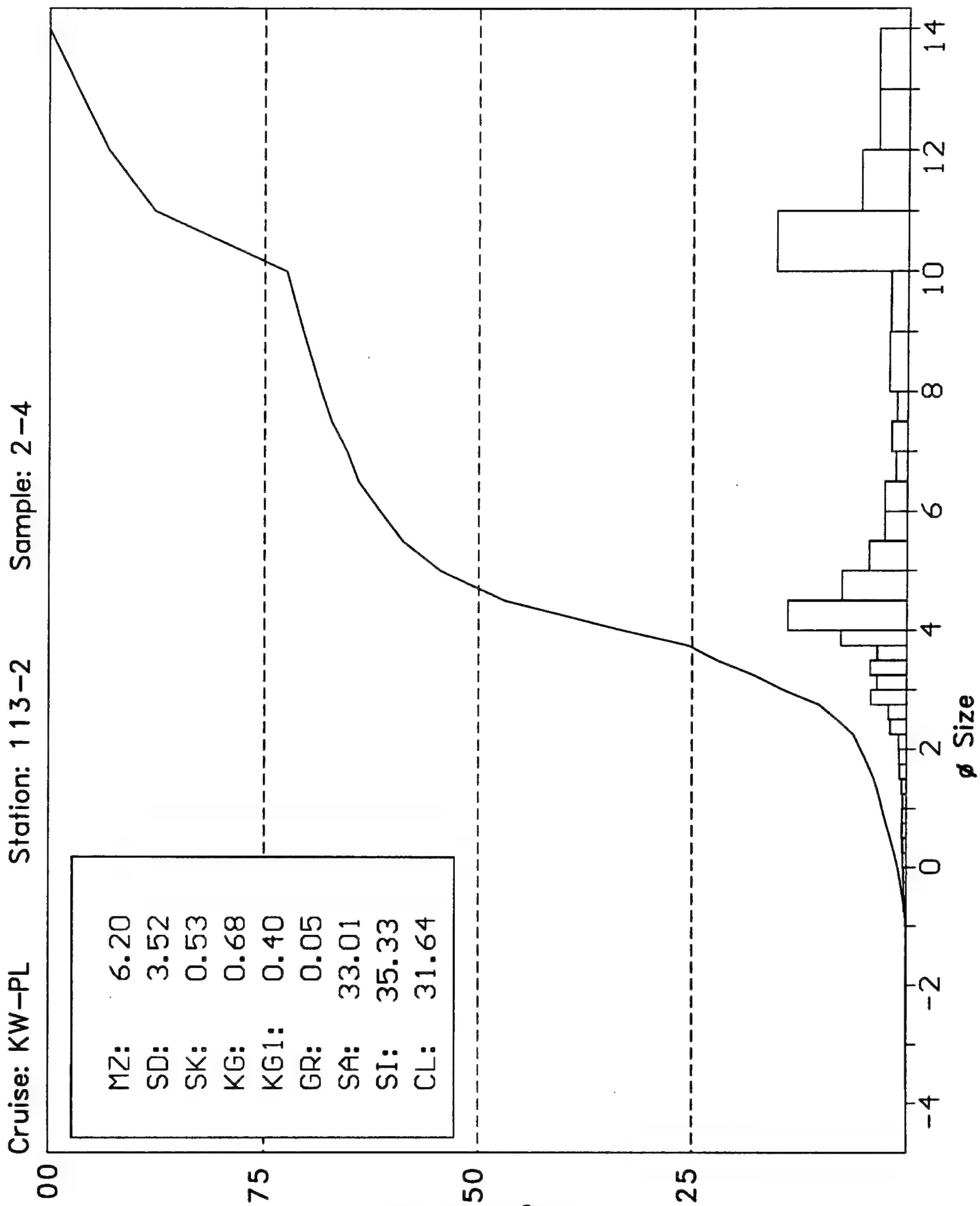

Cruise: KW
Station: 127
Sample: 120
MZ: 5.28
SD: 4.56
SK: 0.33
KG: 0.76
KG1: 0.43
GR: 5.99
SA: 45.17
SI: 20.84
CL: 27.98
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

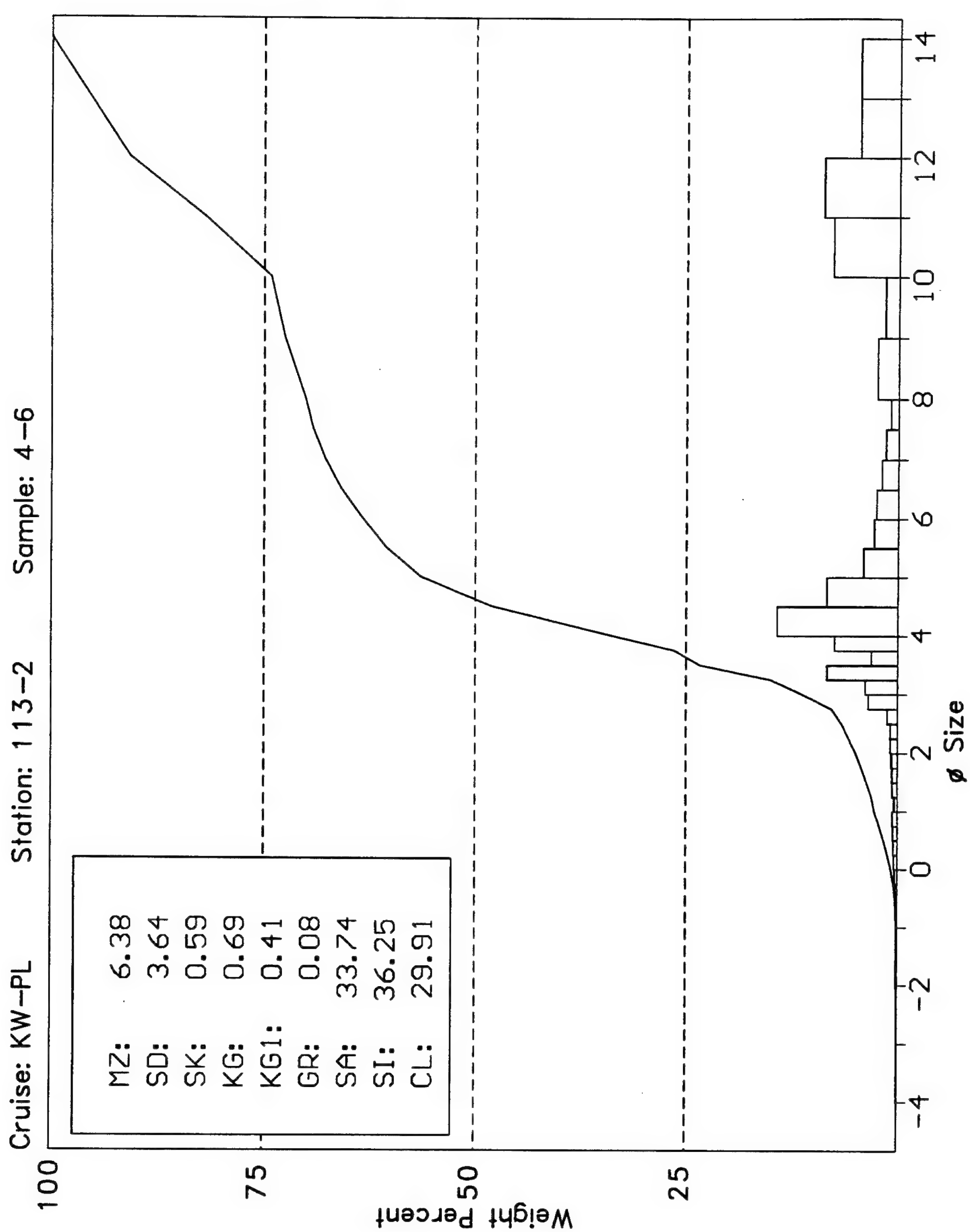


Cruise: KW
Station: 127
Sample: 130
MZ: 4.59
SD: 5.05
SK: 0.25
KG: 0.93
KG1: 0.48
GR: 11.19
SA: 47.16
SI: 16.61
CL: 25.05
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

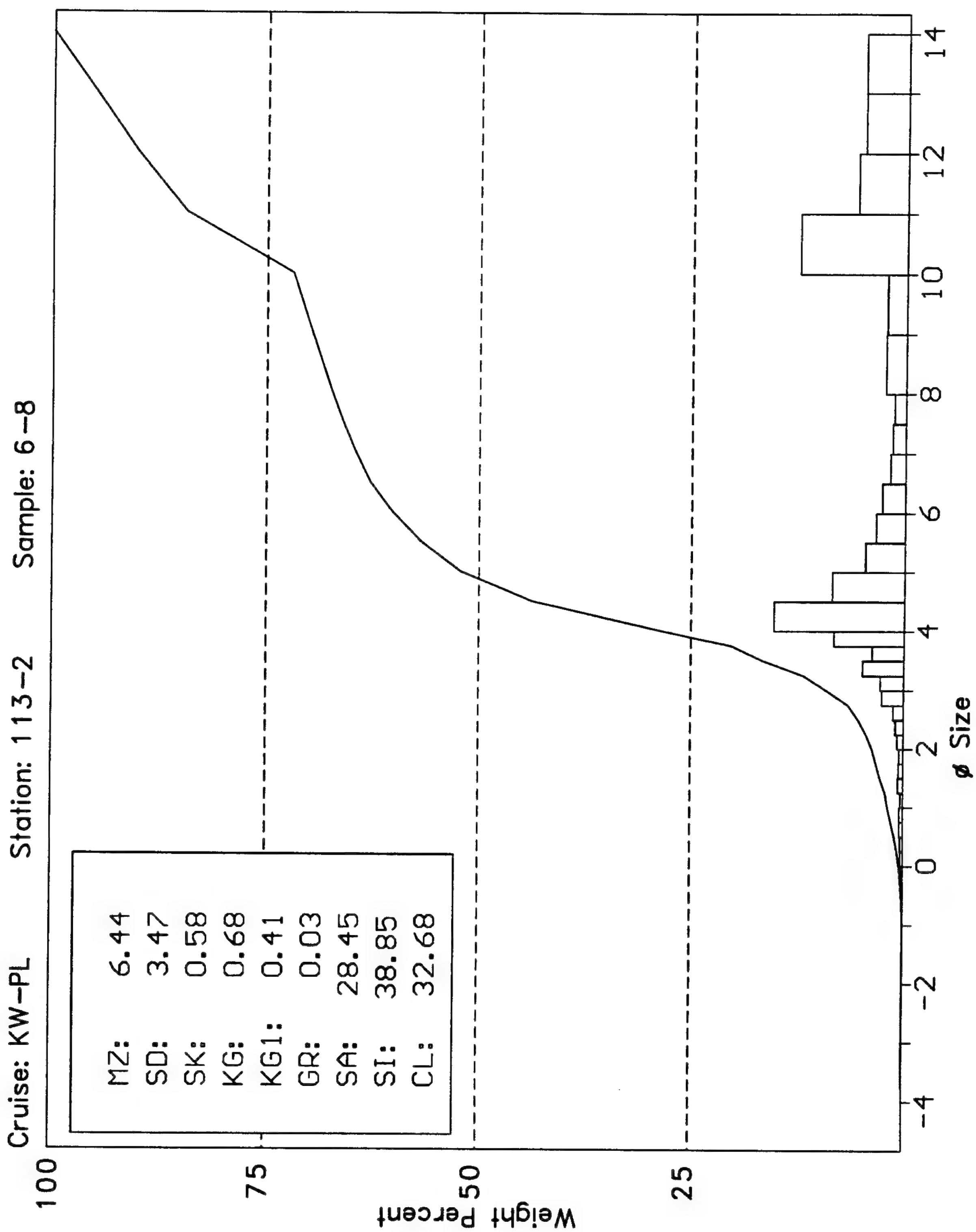


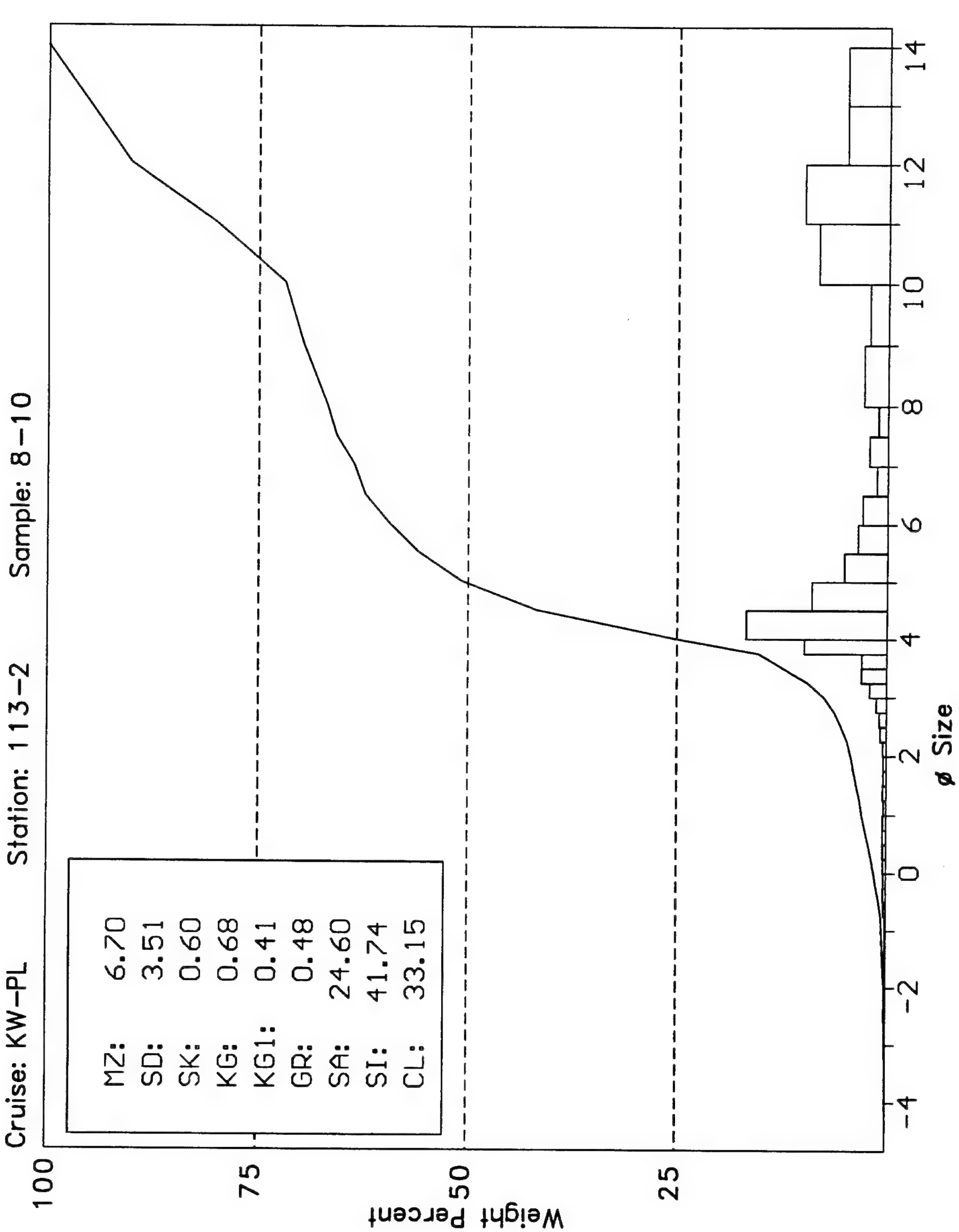
Cruise: KW-PL
Station: 113-2
Sample: 0-2
MZ: 6.91
SD: 3.41
SK: 0.55
KG: 0.65
KG1: 0.40
GR: 0.00
SA: 19.70
SI: 43.07
CL: 37.22
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14


Cruise: KW-PL
Station: 113-2
Sample: 2-4
MZ: 6.20
SD: 3.52
SK: 0.53
KG: 0.68
KG1: 0.40
GR: 0.05
SA: 33.01
SI: 35.33
CL: 31.64
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

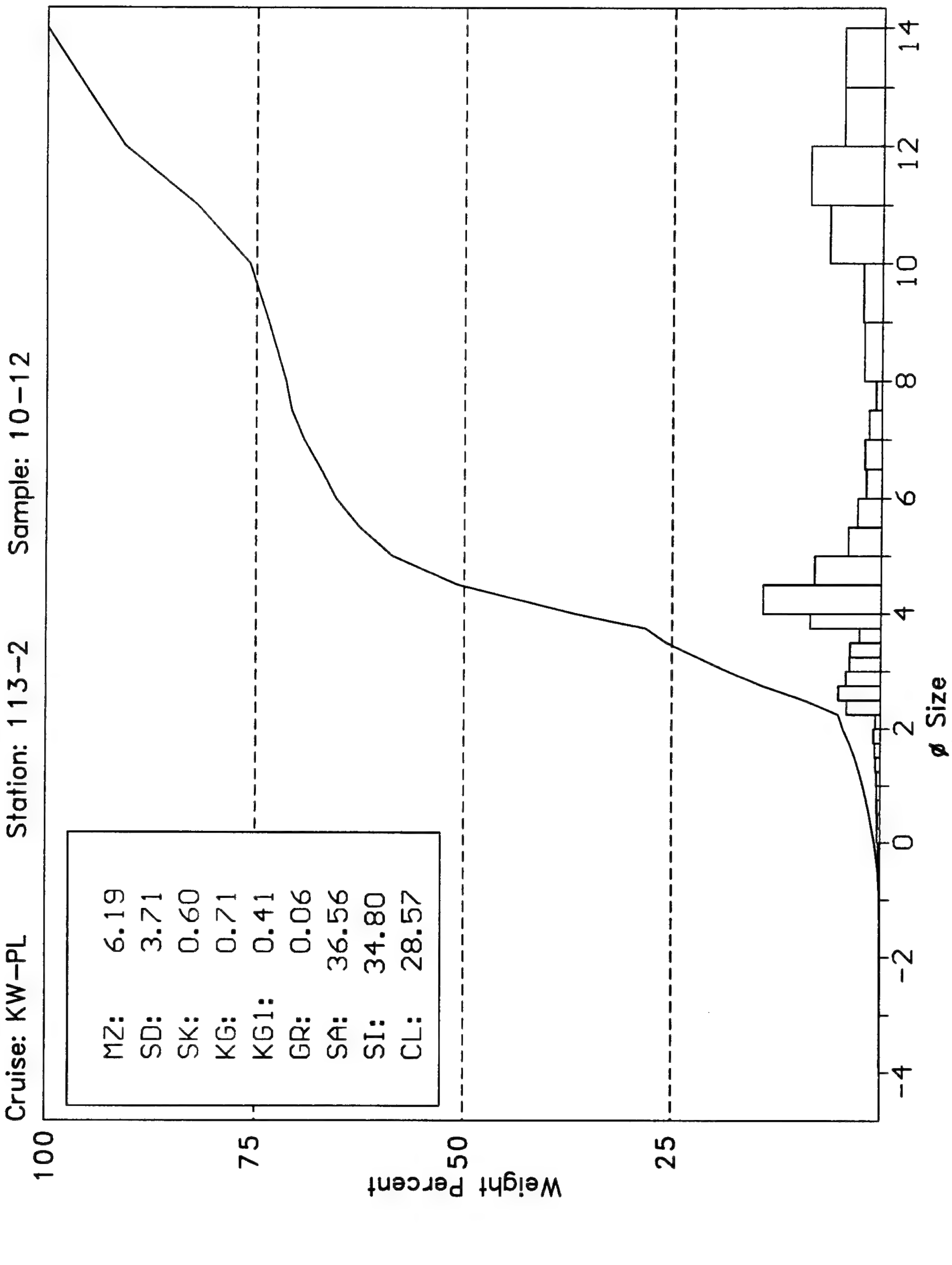


Cruise: KW–PL
Station: 113–2
Sample: 4–6
MZ: 6.38
SD: 3.64
SK: 0.59
KG: 0.69
KG1: 0.41
GR: 0.08
SA: 33.74
SI: 36.25
CL: 29.91
100
75
50
25
Weight Percent
−4
−2
0
2
4
6
8
10
12
14
ø Size

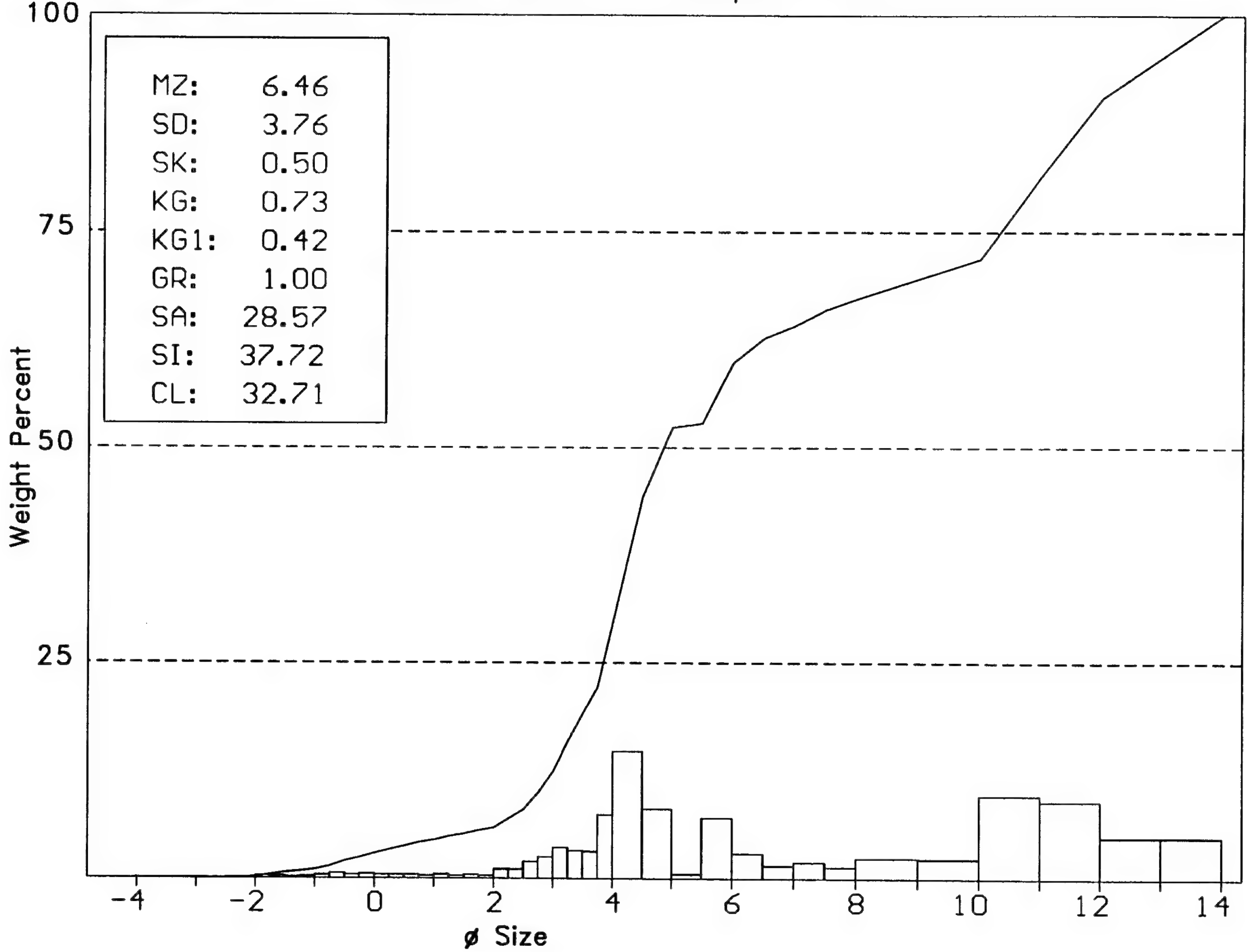

Cruise: KW-PL
Station: 113-2
Sample: 6-8
MZ: 6.44
SD: 3.47
SK: 0.58
KG: 0.68
KG1: 0.41
GR: 0.03
SA: 28.45
SI: 38.85
CL: 32.68
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

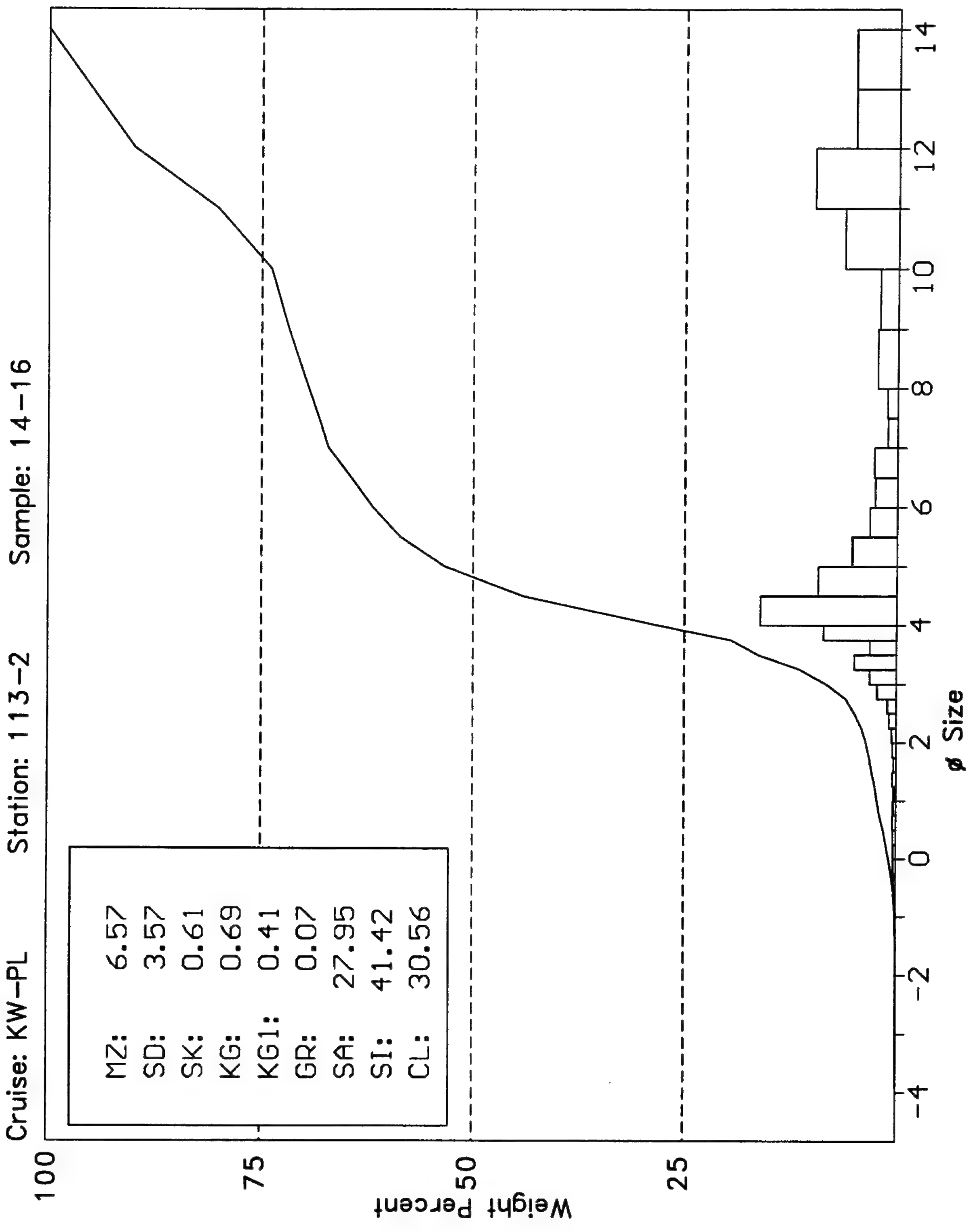


Cruise: KW-PL
Station: 113-2
Sample: 8-10
MZ: 6.70
SD: 3.51
SK: 0.60
KG: 0.68
KG1: 0.41
GR: 0.48
SA: 24.60
SI: 41.74
CL: 33.15
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

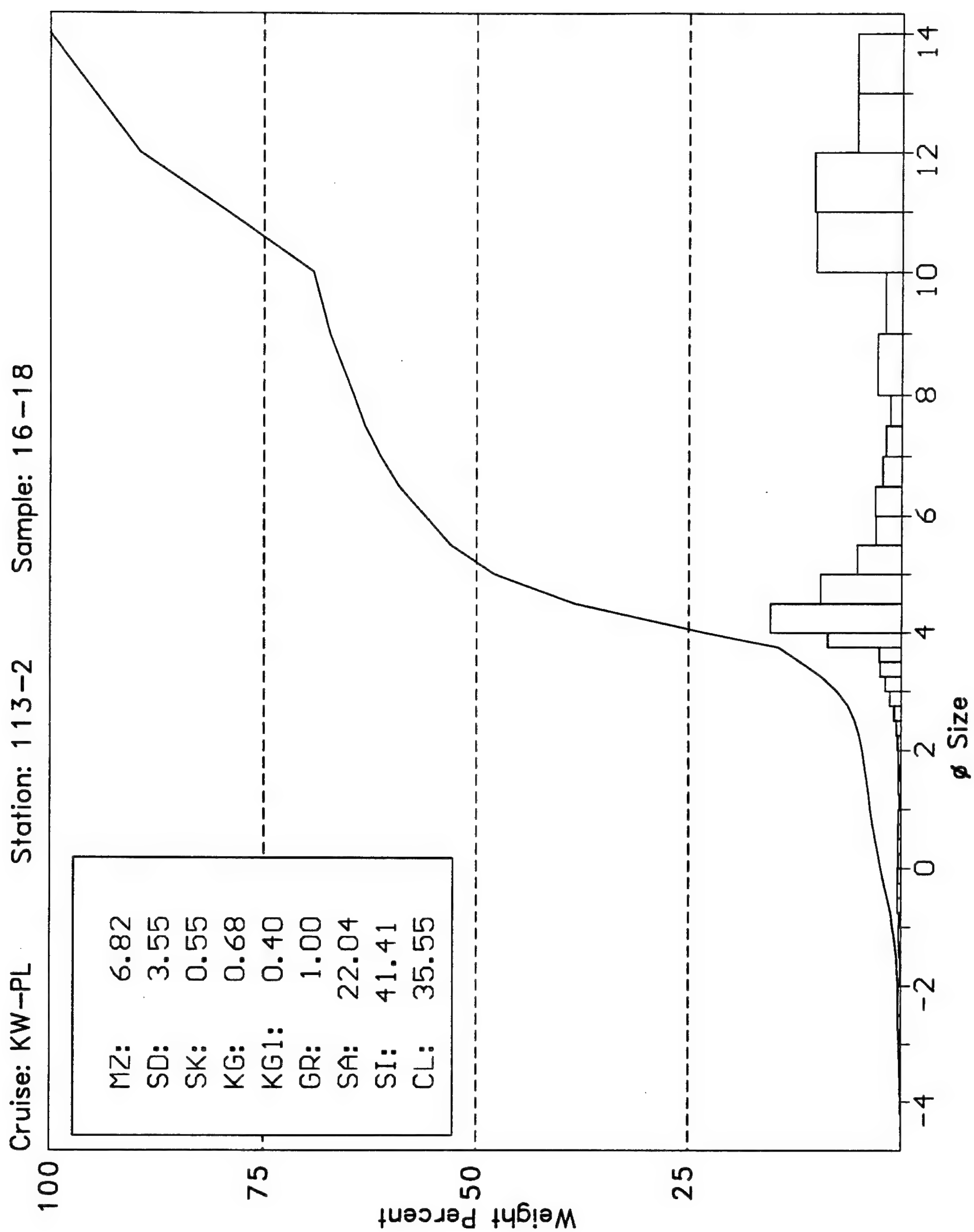

Cruise: KW–PL
Station: 113–2
Sample: 10–12
MZ: 6.19
SD: 3.71
SK: 0.60
KG: 0.71
KG1: 0.41
GR: 0.06
SA: 36.56
SI: 34.80
CL: 28.57
Weight Percent
100
75
50
25
ø Size
–4
–2
0
2
4
6
8
10
12
14

Cruise: KW-PL Station: 113-2 Sample: 12-14

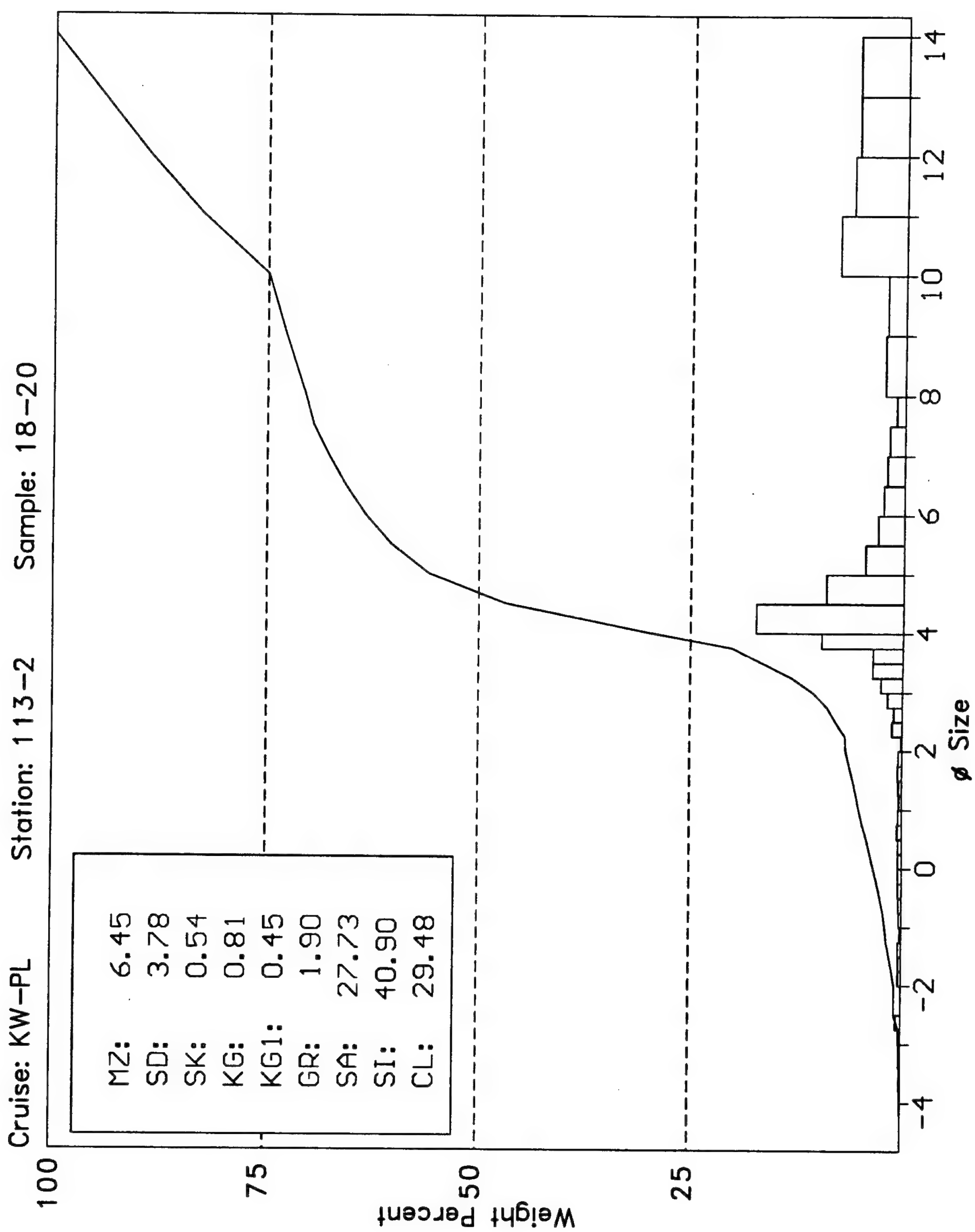


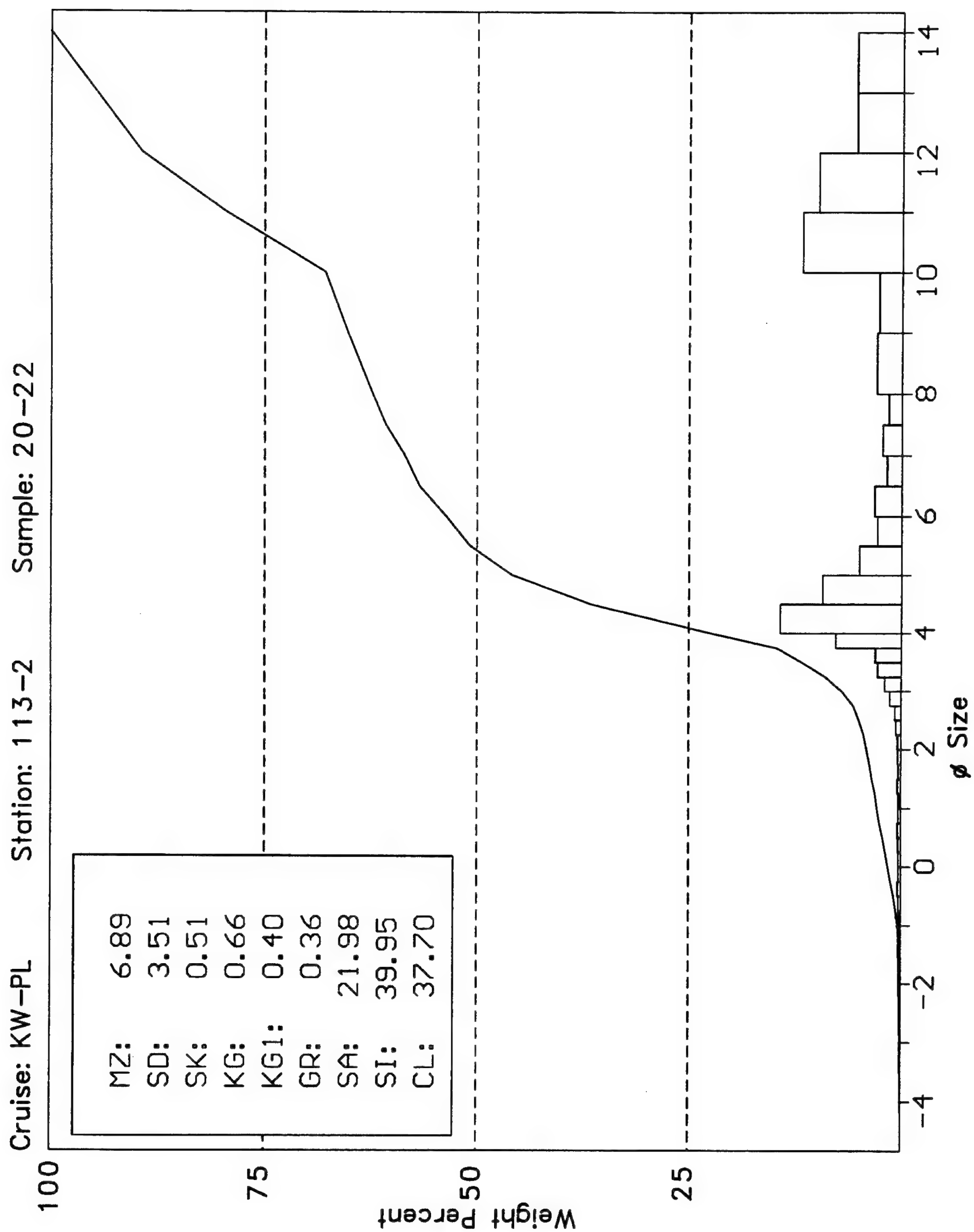


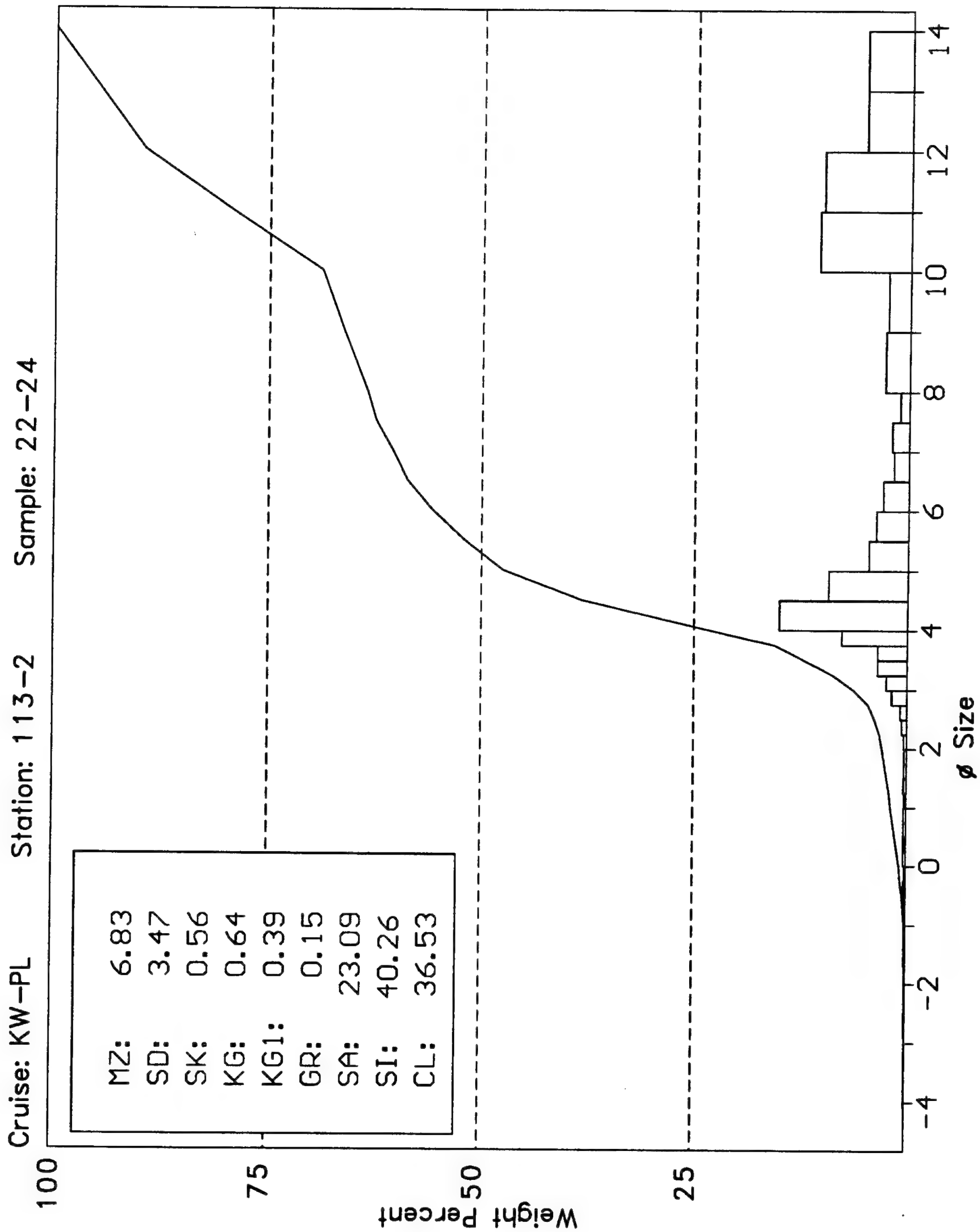
Cruise: KW-PL
Station: 113-2
Sample: 14-16
MZ: 6.57
SD: 3.57
SK: 0.61
KG: 0.69
KG1: 0.41
GR: 0.07
SA: 27.95
SI: 41.42
CL: 30.56
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

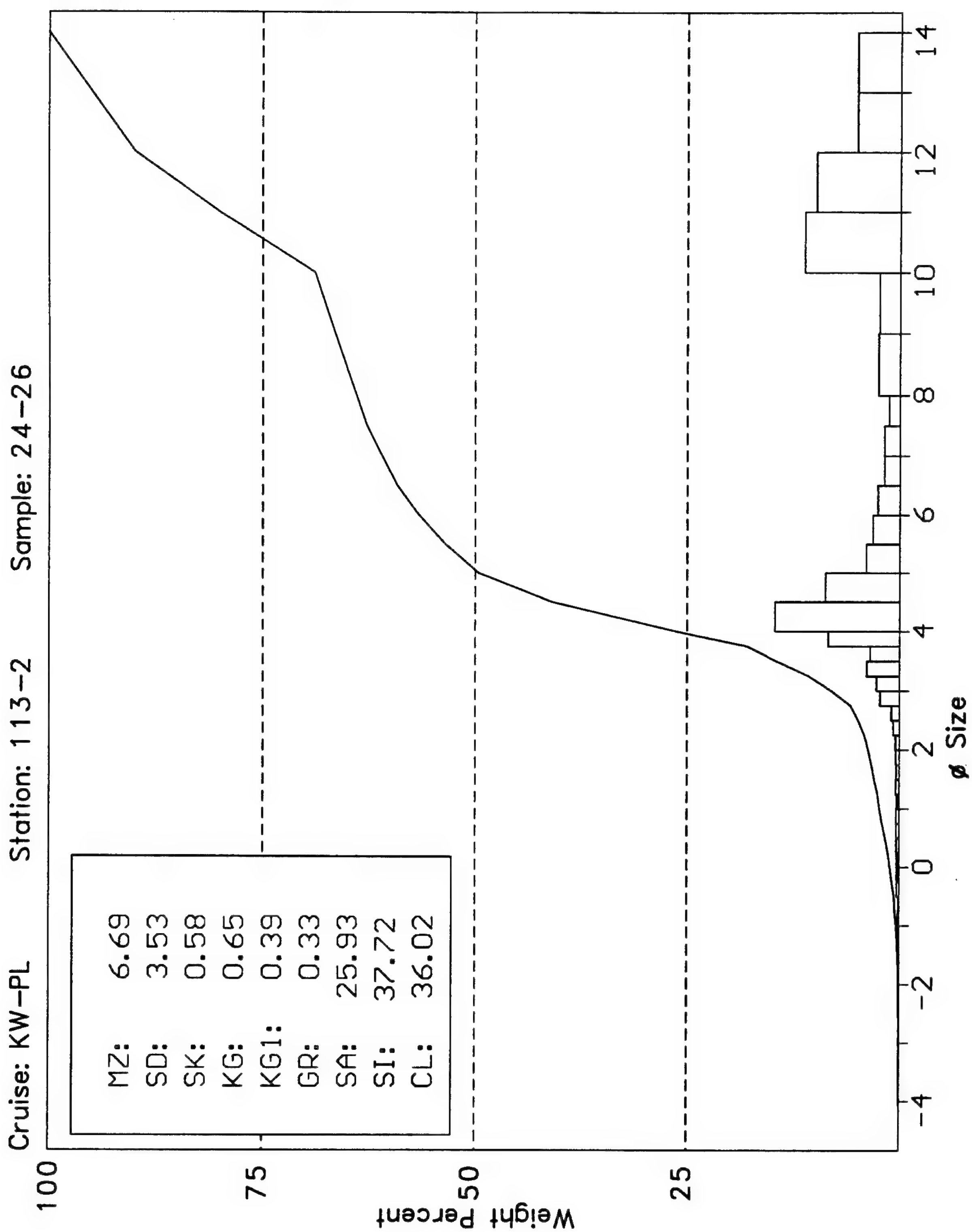


Cruise: KW–PL
Station: 113–2
Sample: 16–18
MZ: 6.82
SD: 3.55
SK: 0.55
KG: 0.68
KG1: 0.40
GR: 1.00
SA: 22.04
SI: 41.41
CL: 35.55
100
75
50
25
Weight Percent
–4
–2
0
2
4
6
8
10
12
14
ø Size

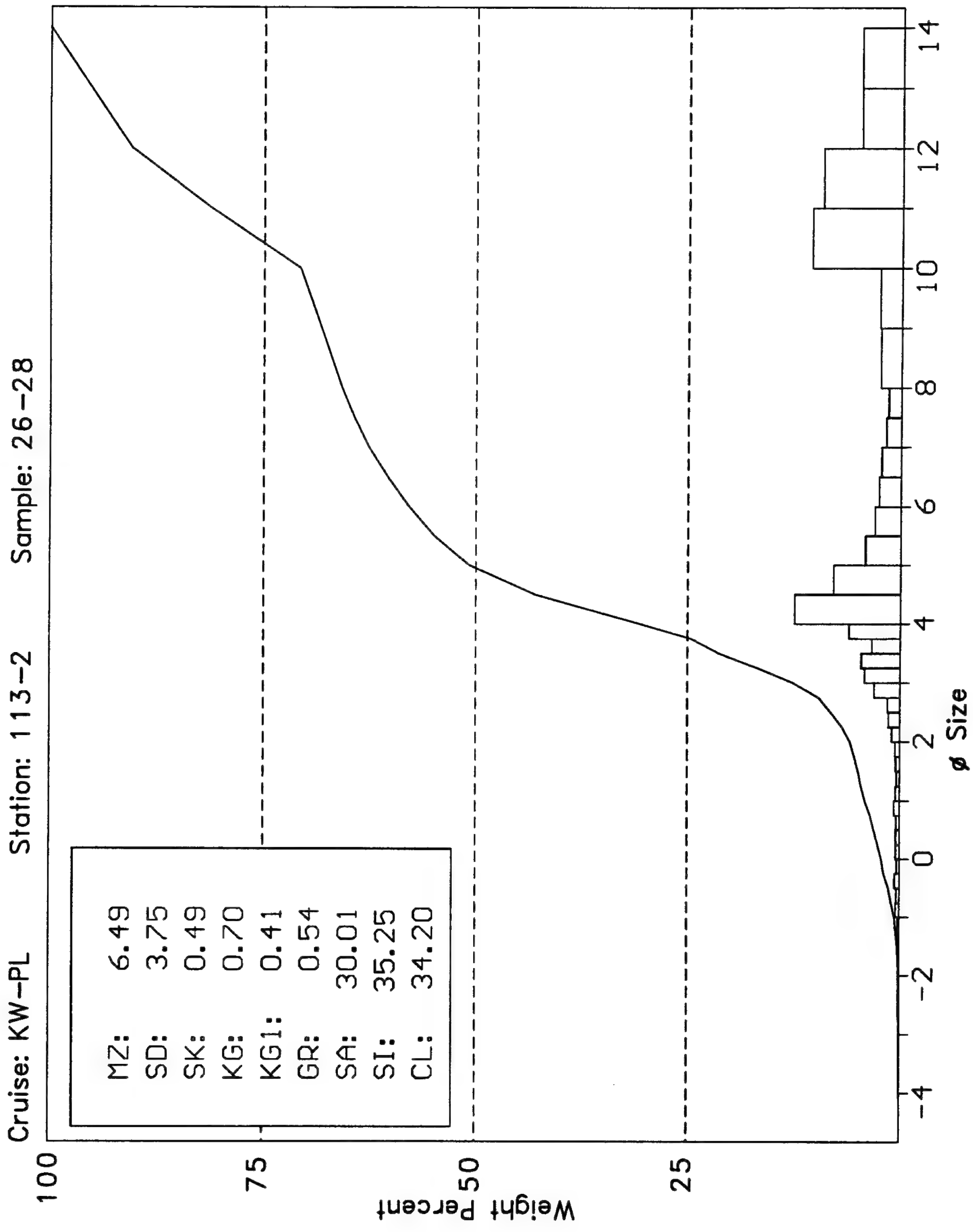

Cruise: KW-PL
Station: 113-2
Sample: 18-20
MZ: 6.45
SD: 3.78
SK: 0.54
KG: 0.81
KG1: 0.45
GR: 1.90
SA: 27.73
SI: 40.90
CL: 29.48
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14


Cruise: KW-PL
Station: 113-2
Sample: 20-22
MZ: 6.89
SD: 3.51
SK: 0.51
KG: 0.66
KG1: 0.40
GR: 0.36
SA: 21.98
SI: 39.95
CL: 37.70
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

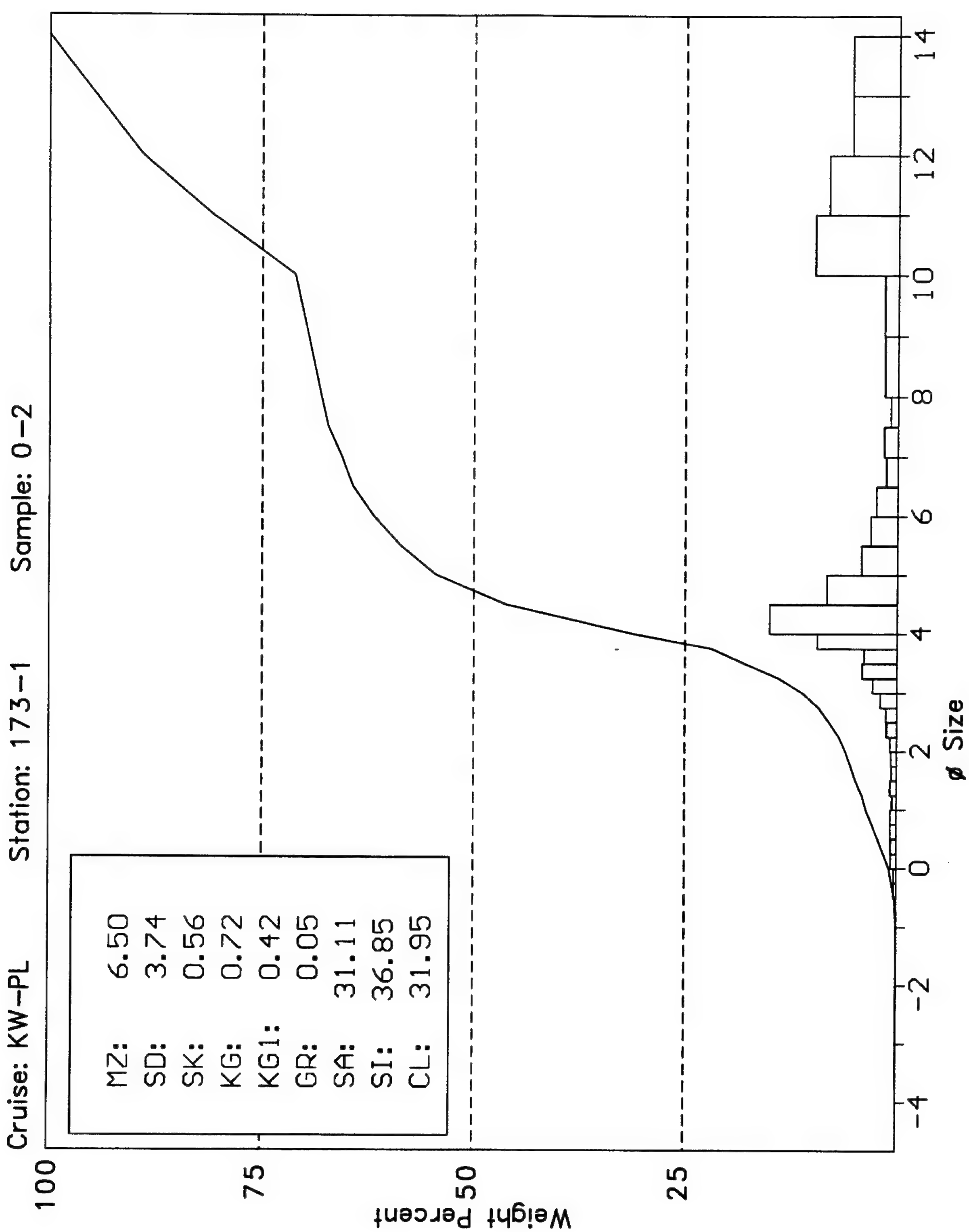

Cruise: KW–PL
Station: 113–2
Sample: 22–24
MZ: 6.83
SD: 3.47
SK: 0.56
KG: 0.64
KG1: 0.39
GR: 0.15
SA: 23.09
SI: 40.26
CL: 36.53
100
75
50
25
Weight Percent
–4
–2
0
2
4
6
8
10
12
14
ø Size

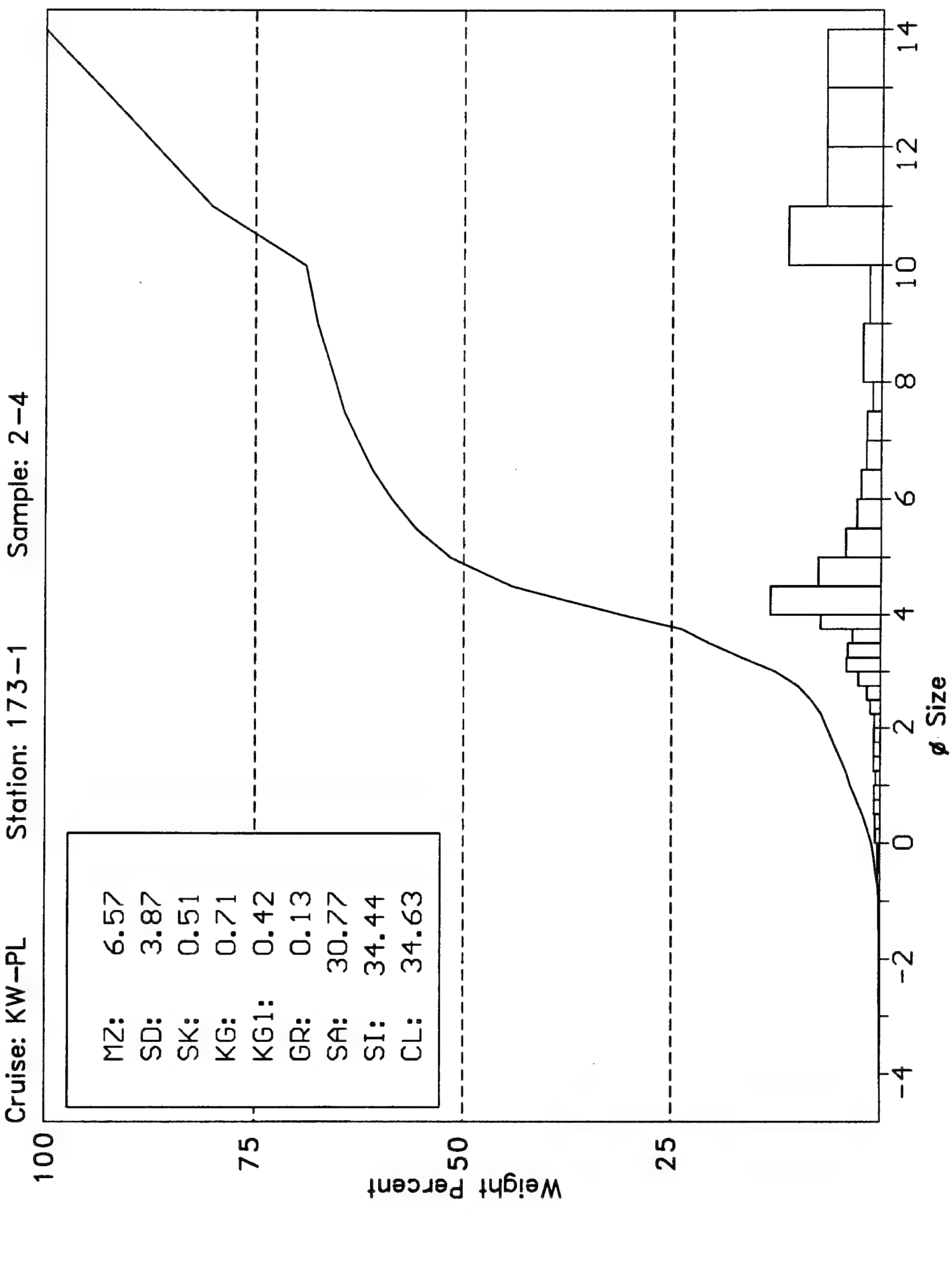


Cruise: KW-PL
Station: 113-2
Sample: 24-26
MZ: 6.69
SD: 3.53
SK: 0.58
KG: 0.65
KG1: 0.39
GR: 0.33
SA: 25.93
SI: 37.72
CL: 36.02
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

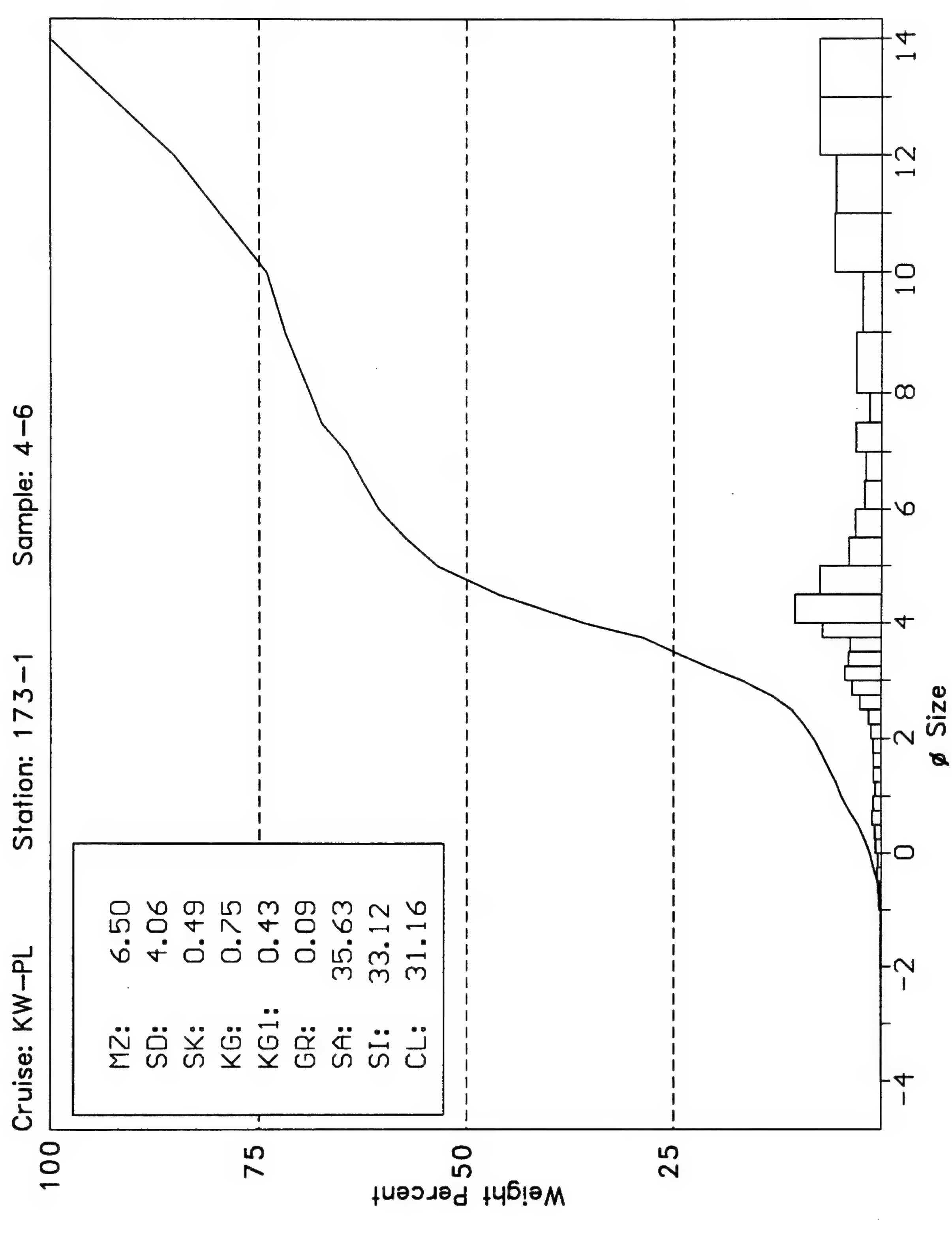


Cruise: KW-PL
Station: 113-2
Sample: 26-28
MZ: 6.49
SD: 3.75
SK: 0.49
KG: 0.70
KG1: 0.41
GR: 0.54
SA: 30.01
SI: 35.25
CL: 34.20
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

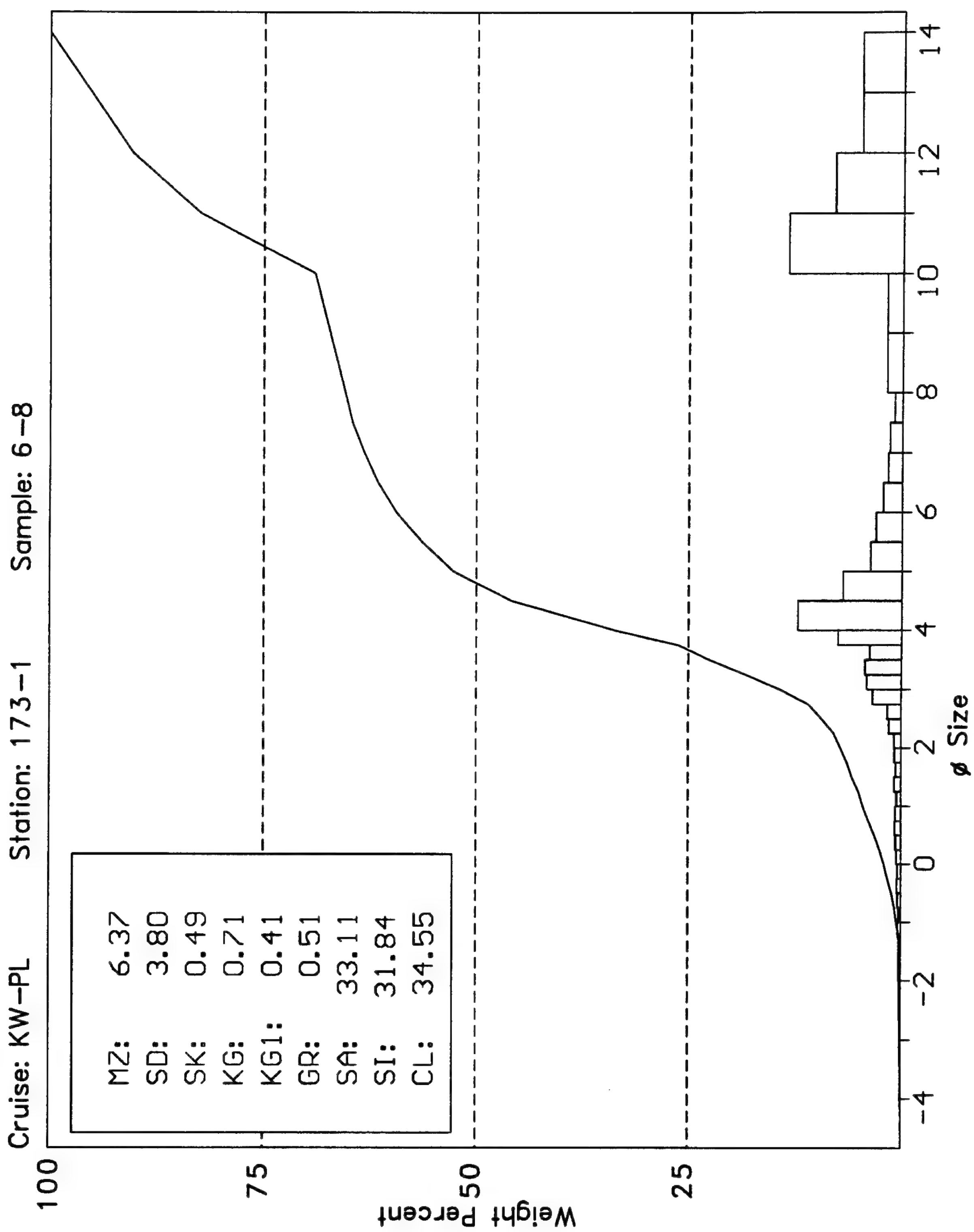

Cruise: KW–PL
Station: 173–1
Sample: 0–2
MZ: 6.50
SD: 3.74
SK: 0.56
KG: 0.72
KG1: 0.42
GR: 0.05
SA: 31.11
SI: 36.85
CL: 31.95
100
75
50
25
Weight Percent
–4
–2
0
2
4
6
8
10
12
14
ø Size



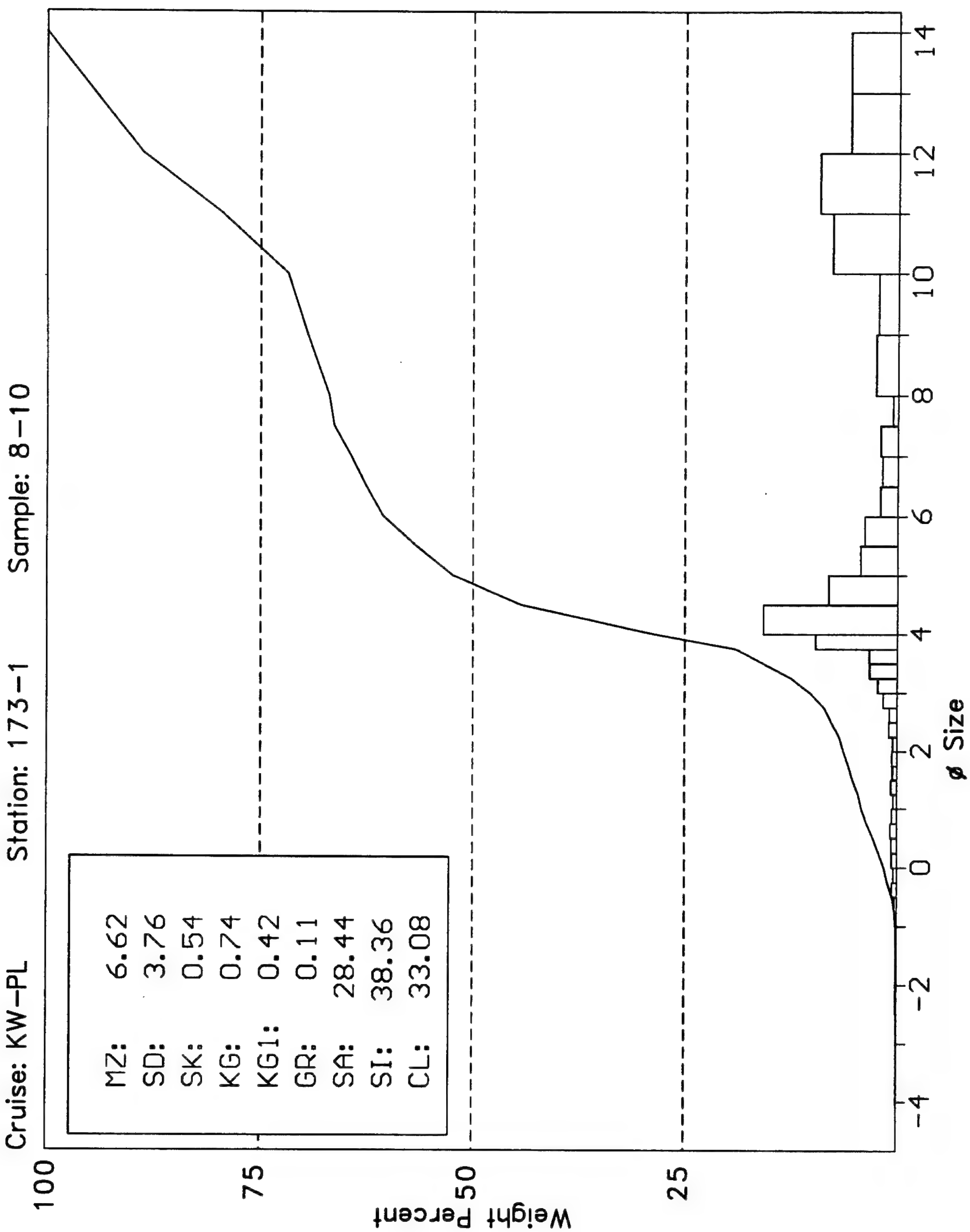
Cruise: KW-PL
Station: 173-1
Sample: 2-4
MZ: 6.57
SD: 3.87
SK: 0.51
KG: 0.71
KG1: 0.42
GR: 0.13
SA: 30.77
SI: 34.44
CL: 34.63
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14



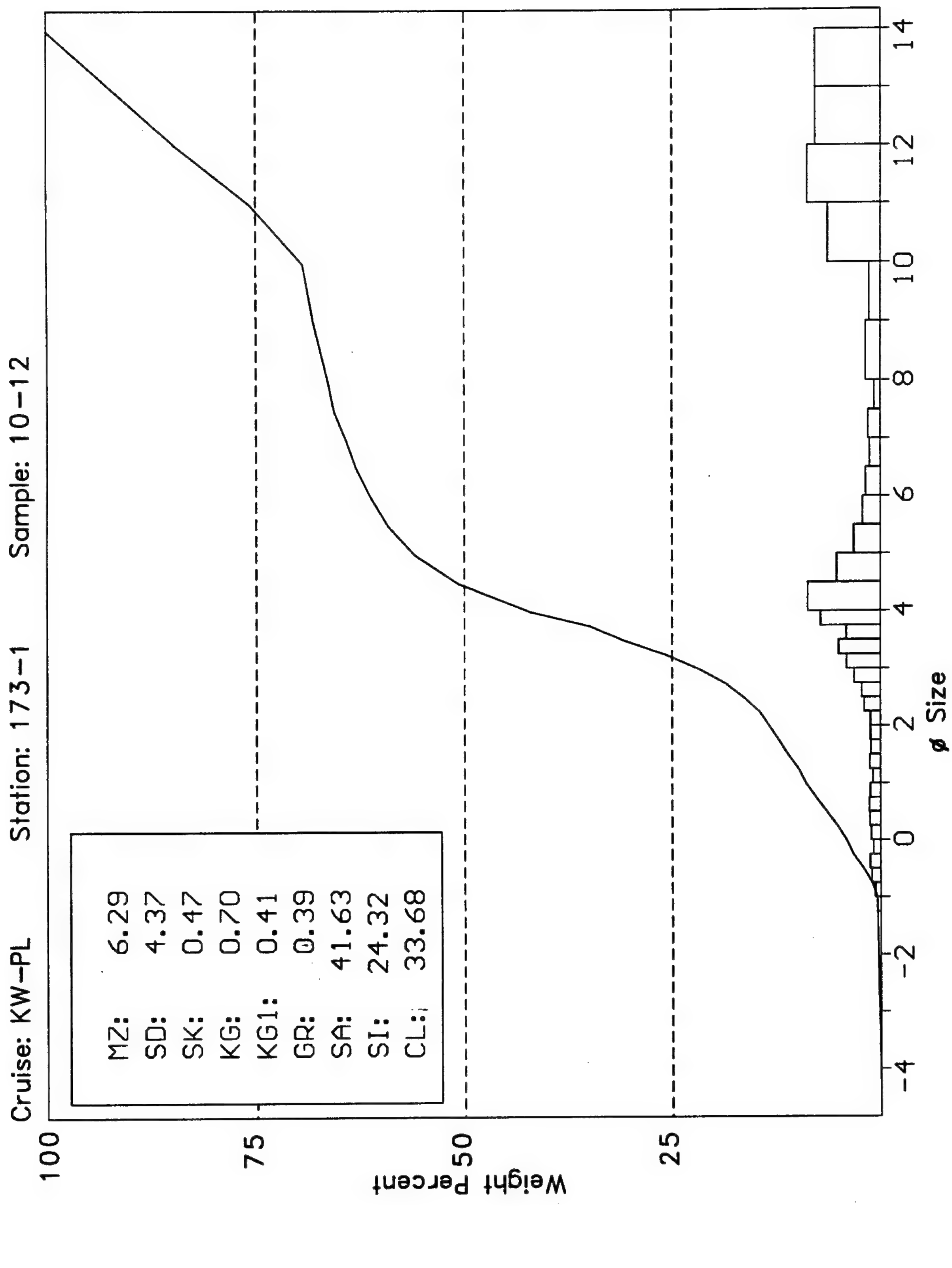
Cruise: KW–PL
Station: 173–1
Sample: 4–6
MZ: 6.50
SD: 4.06
SK: 0.49
KG: 0.75
KG1: 0.43
GR: 0.09
SA: 35.63
SI: 33.12
CL: 31.16
100
75
50
25
Weight Percent
–4
–2
0
2
4
6
8
10
12
14
ø Size

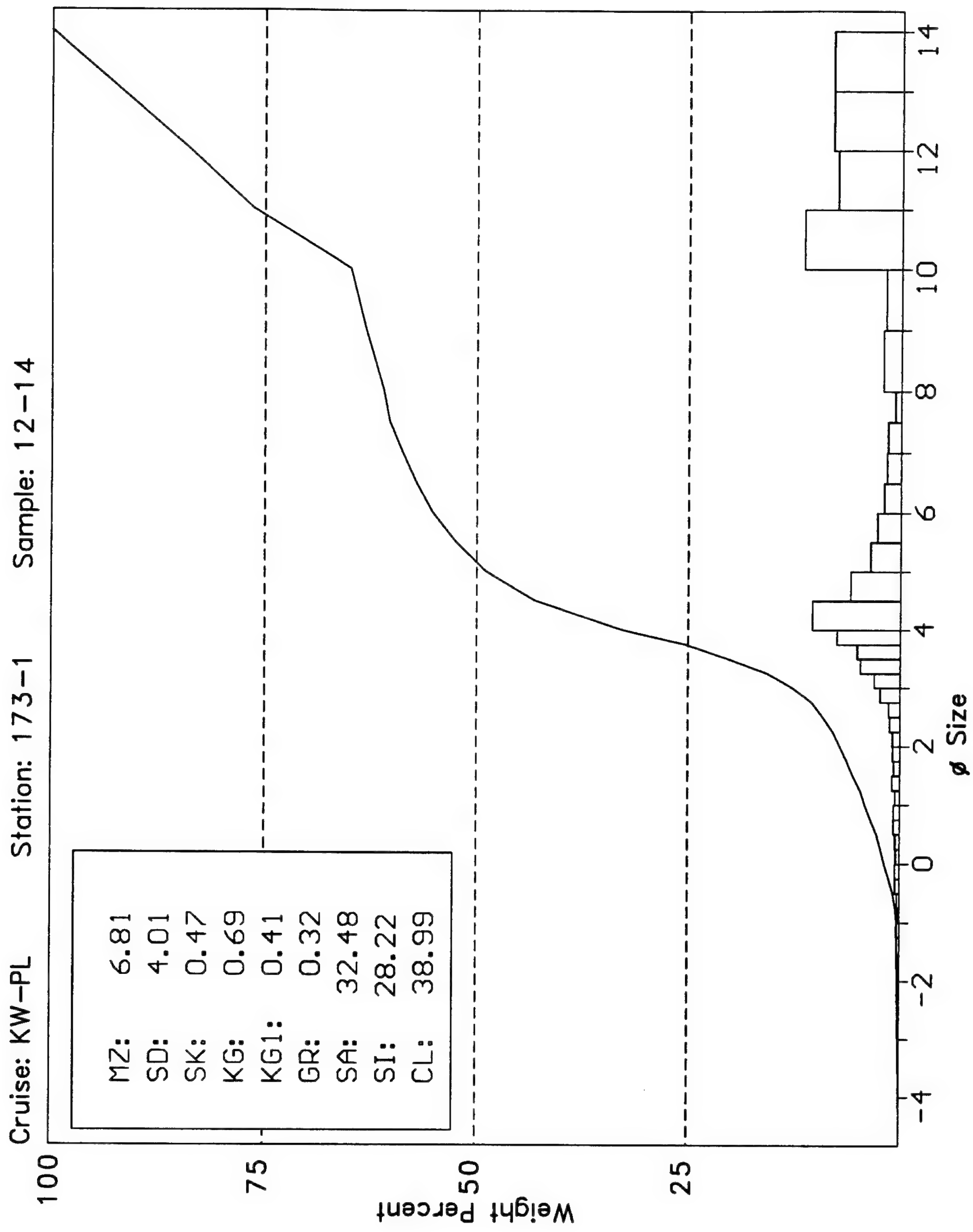


Cruise: KW–PL
Station: 173–1
Sample: 6–8
MZ: 6.37
SD: 3.80
SK: 0.49
KG: 0.71
KG1: 0.41
GR: 0.51
SA: 33.11
SI: 31.84
CL: 34.55
Weight Percent
100
75
50
25
ø Size
–4
–2
0
2
4
6
8
10
12
14

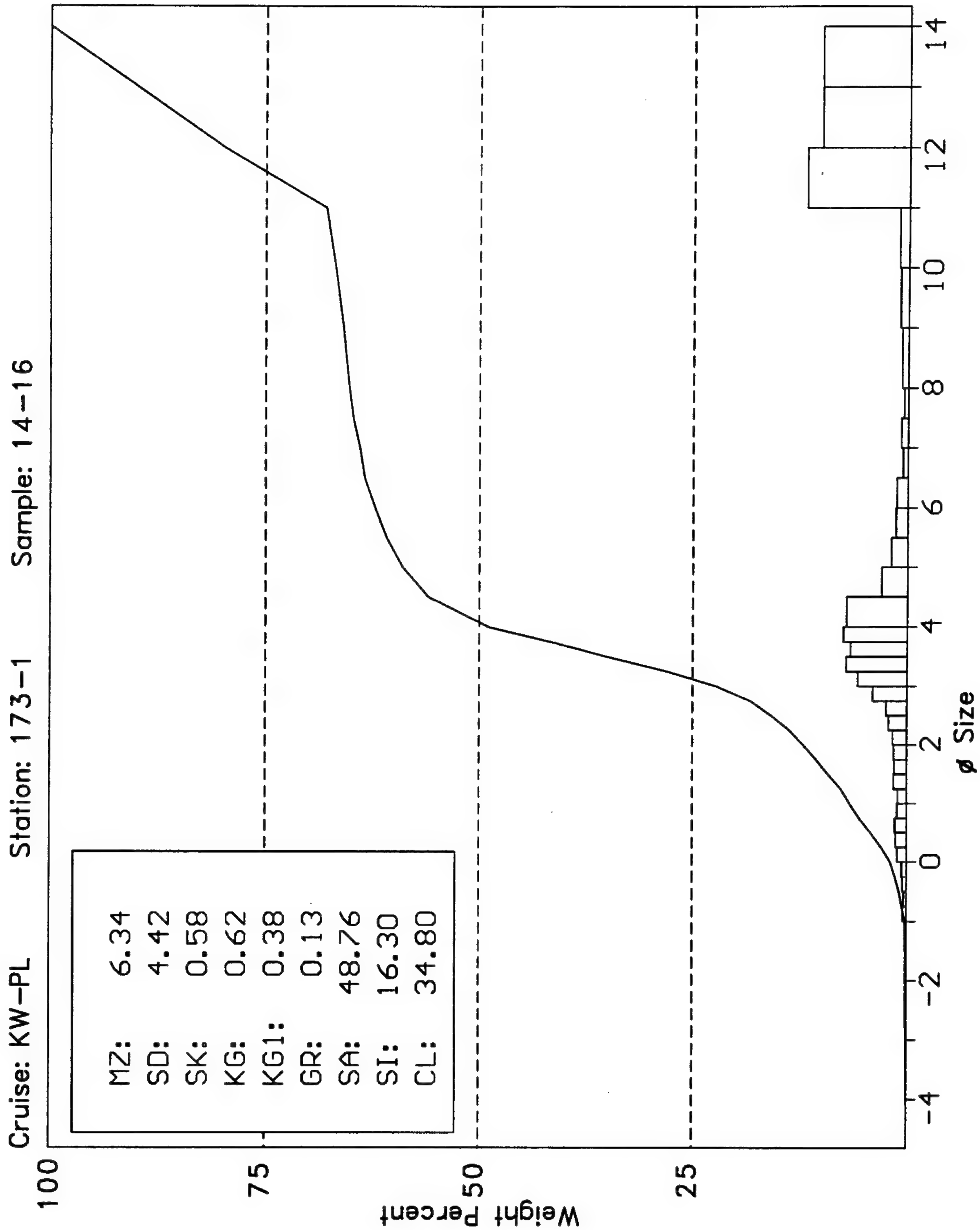


Cruise: KW–PL
Station: 173–1
Sample: 8–10
MZ: 6.62
SD: 3.76
SK: 0.54
KG: 0.74
KG1: 0.42
GR: 0.11
SA: 28.44
SI: 38.36
CL: 33.08
Weight Percent
100
75
50
25
ø Size
–4
–2
0
2
4
6
8
10
12
14

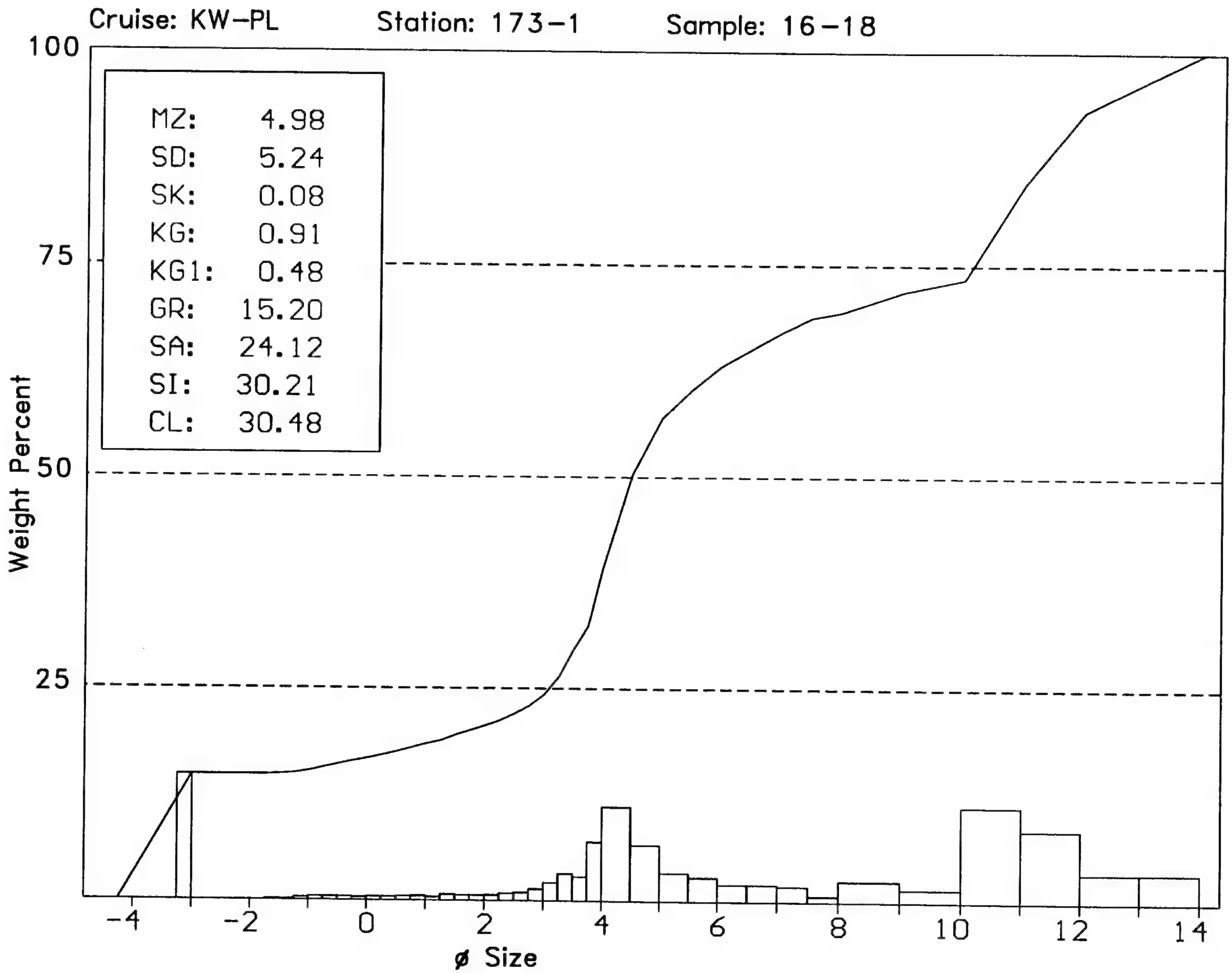

Cruise: KW-PL
Station: 173-1
Sample: 10-12
MZ: 6.29
SD: 4.37
SK: 0.47
KG: 0.70
KG1: 0.41
GR: 0.39
SA: 41.63
SI: 24.32
CL: 33.68
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14



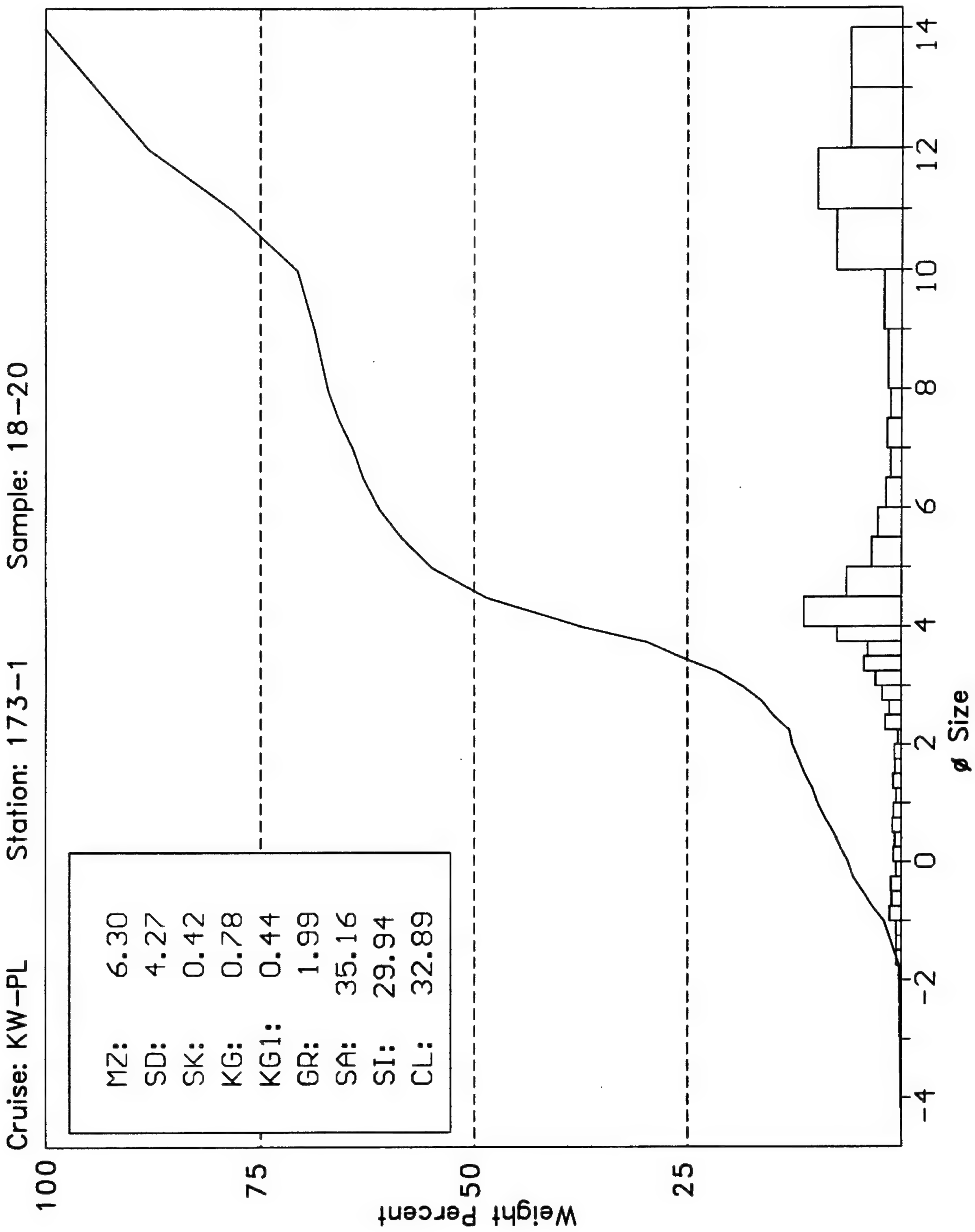
Cruise: KW-PL
Station: 173-1
Sample: 12-14
MZ: 6.81
SD: 4.01
SK: 0.47
KG: 0.69
KG1: 0.41
GR: 0.32
SA: 32.48
SI: 28.22
CL: 38.99
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

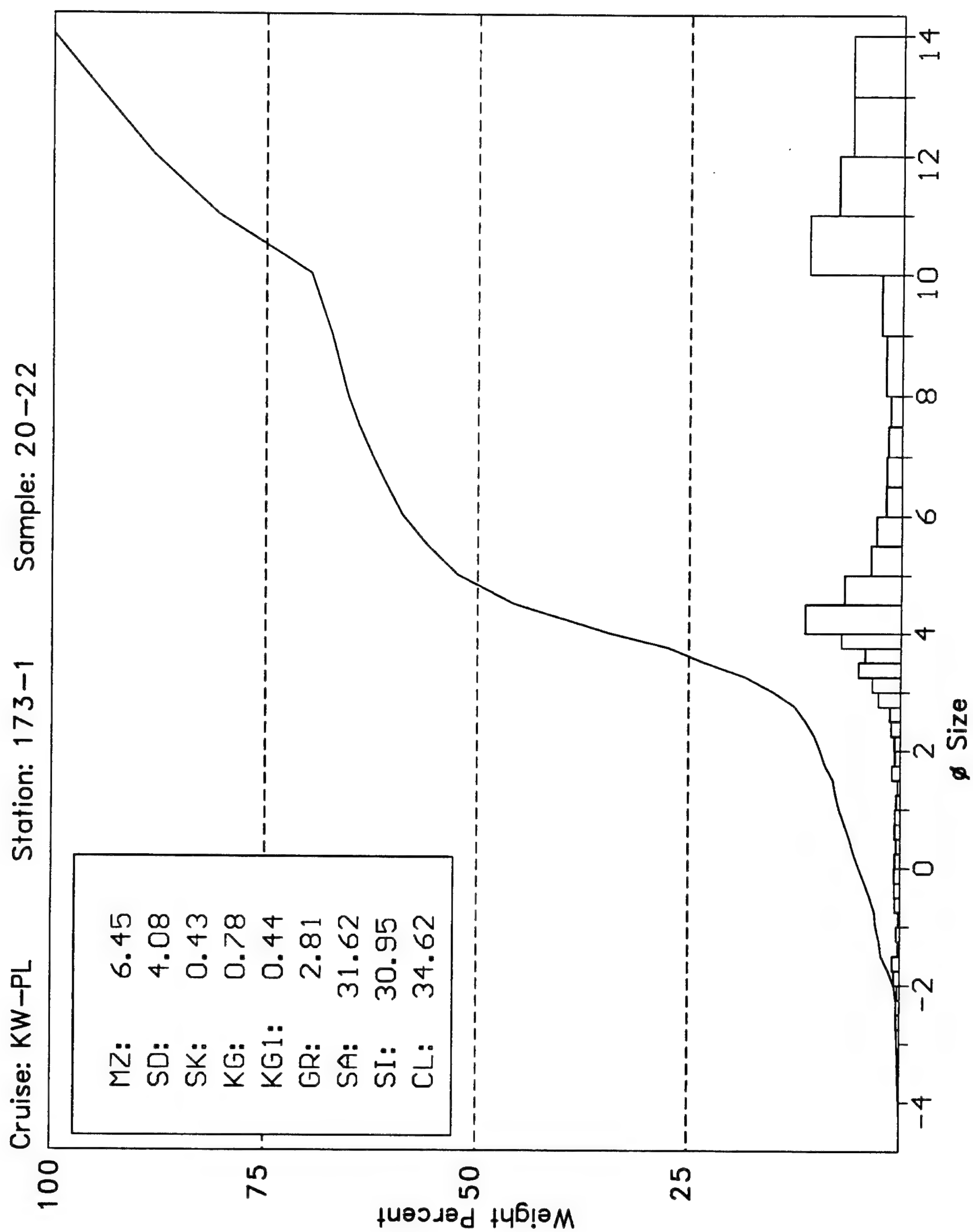


Cruise: KW-PL
Station: 173-1
Sample: 14-16
MZ: 6.34
SD: 4.42
SK: 0.58
KG: 0.62
KG1: 0.38
GR: 0.13
SA: 48.76
SI: 16.30
CL: 34.80
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

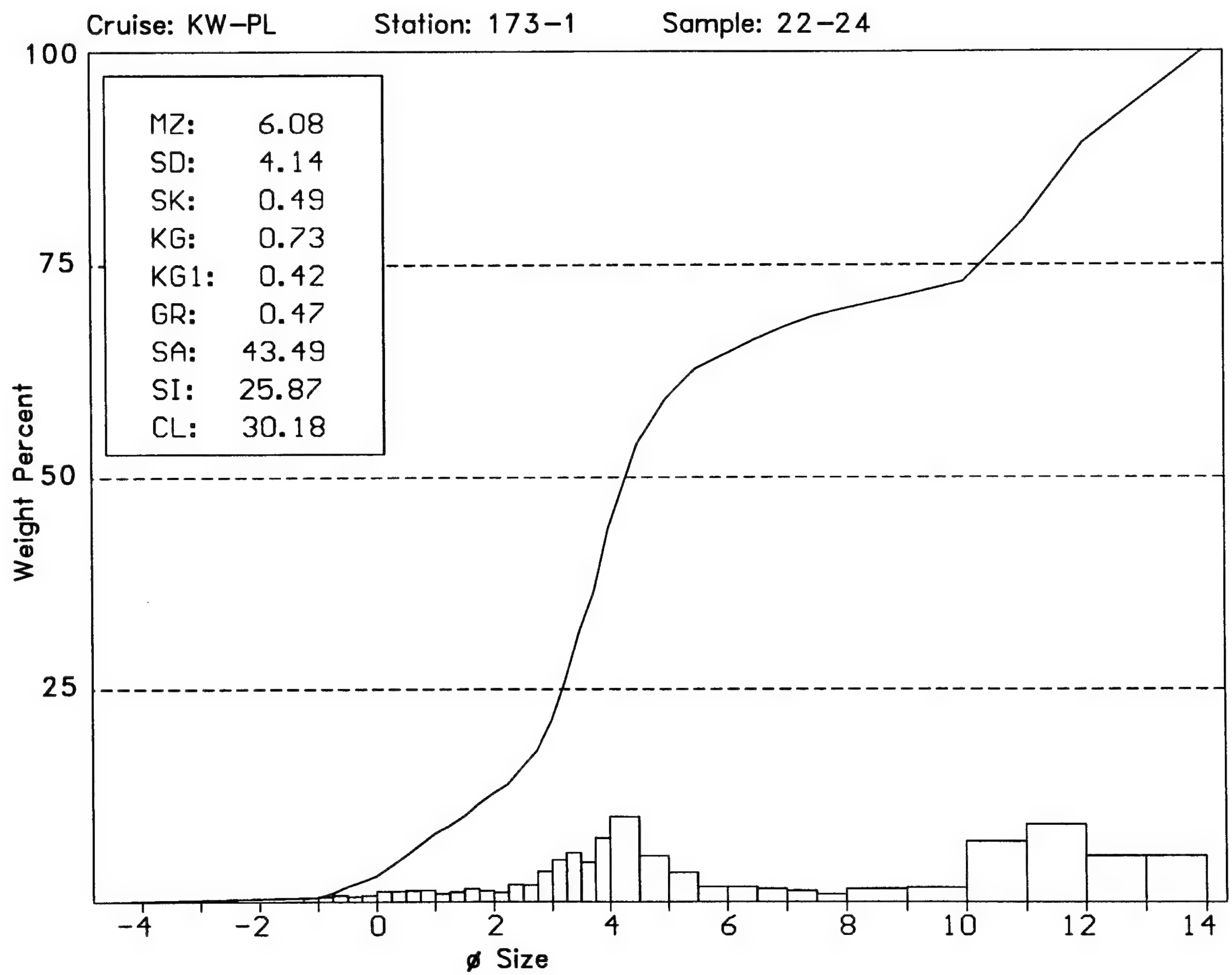


Cruise: KW-PL
Station: 173-1
Sample: 16-18
MZ: 4.98
SD: 5.24
SK: 0.08
KG: 0.91
KG1: 0.48
GR: 15.20
SA: 24.12
SI: 30.21
CL: 30.48
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

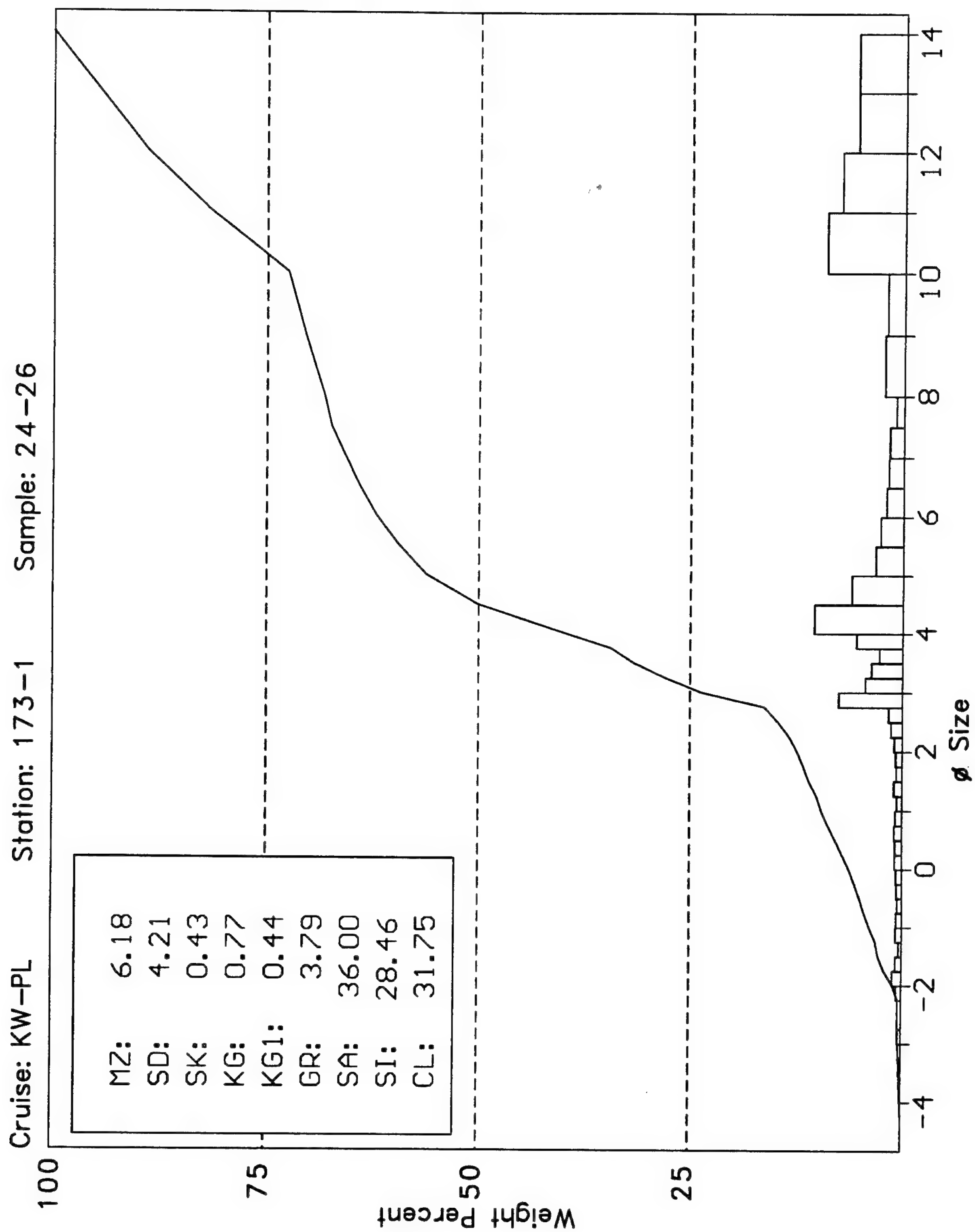

Cruise: KW-PL
Station: 173-1
Sample: 18-20
MZ: 6.30
SD: 4.27
SK: 0.42
KG: 0.78
KG1: 0.44
GR: 1.99
SA: 35.16
SI: 29.94
CL: 32.89
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size



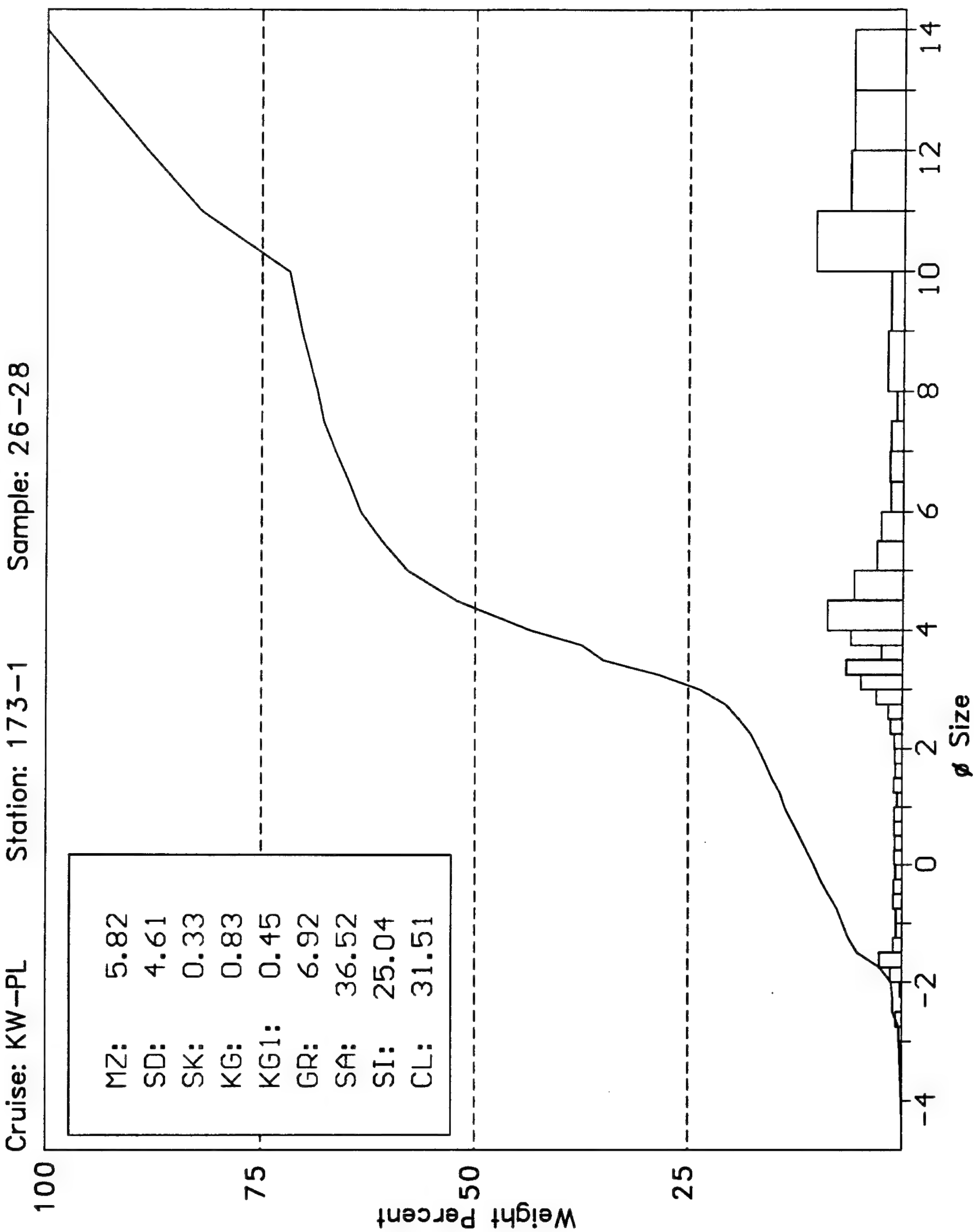
Cruise: KW-PL
Station: 173-1
Sample: 20-22
MZ: 6.45
SD: 4.08
SK: 0.43
KG: 0.78
KG1: 0.44
GR: 2.81
SA: 31.62
SI: 30.95
CL: 34.62
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14



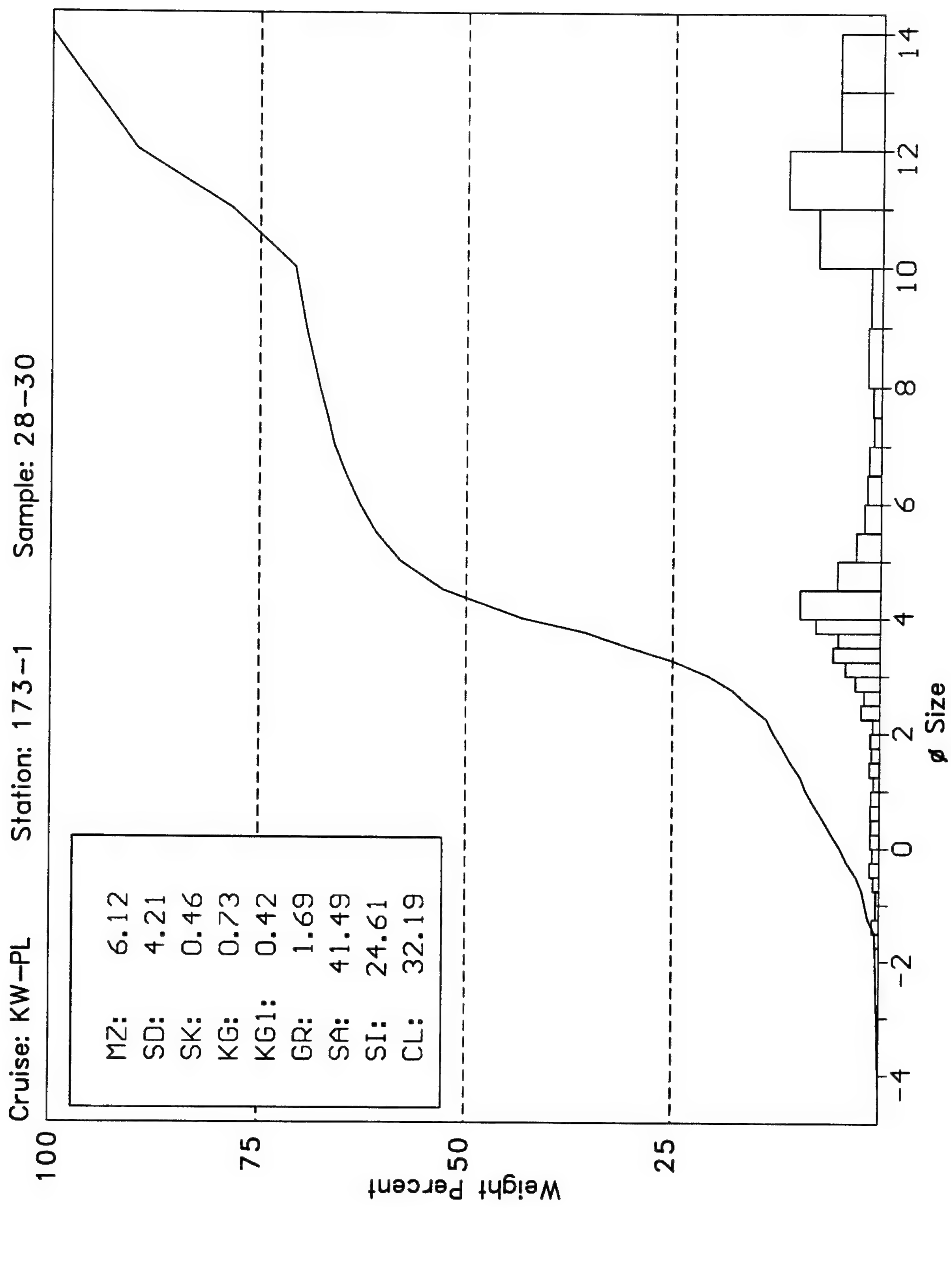
Cruise: KW-PL
Station: 173-1
Sample: 22-24
MZ: 6.08
SD: 4.14
SK: 0.49
KG: 0.73
KG1: 0.42
GR: 0.47
SA: 43.49
SI: 25.87
CL: 30.18
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

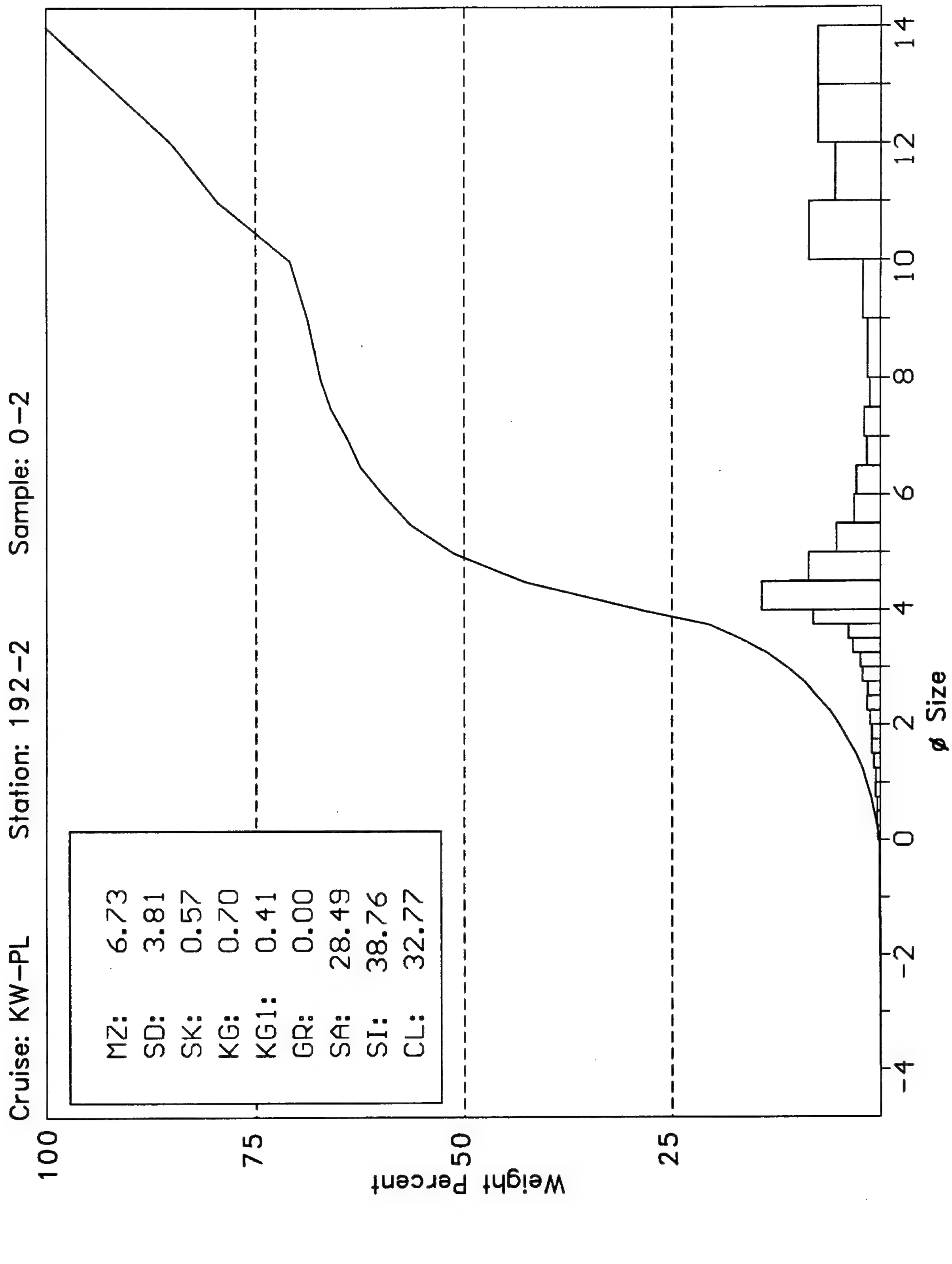


Cruise: KW-PL
Station: 173-1
Sample: 24-26
MZ: 6.18
SD: 4.21
SK: 0.43
KG: 0.77
KG1: 0.44
GR: 3.79
SA: 36.00
SI: 28.46
CL: 31.75
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

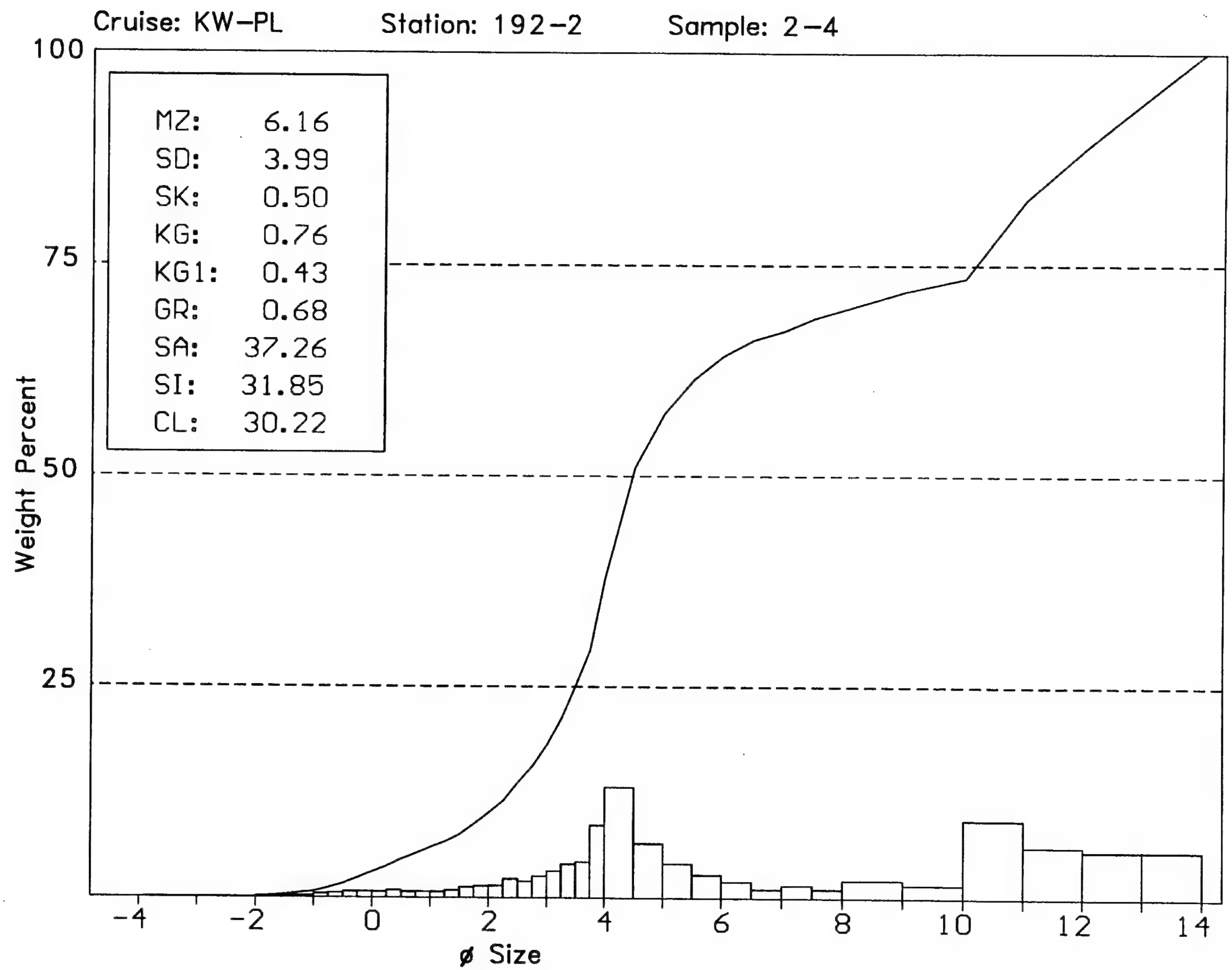


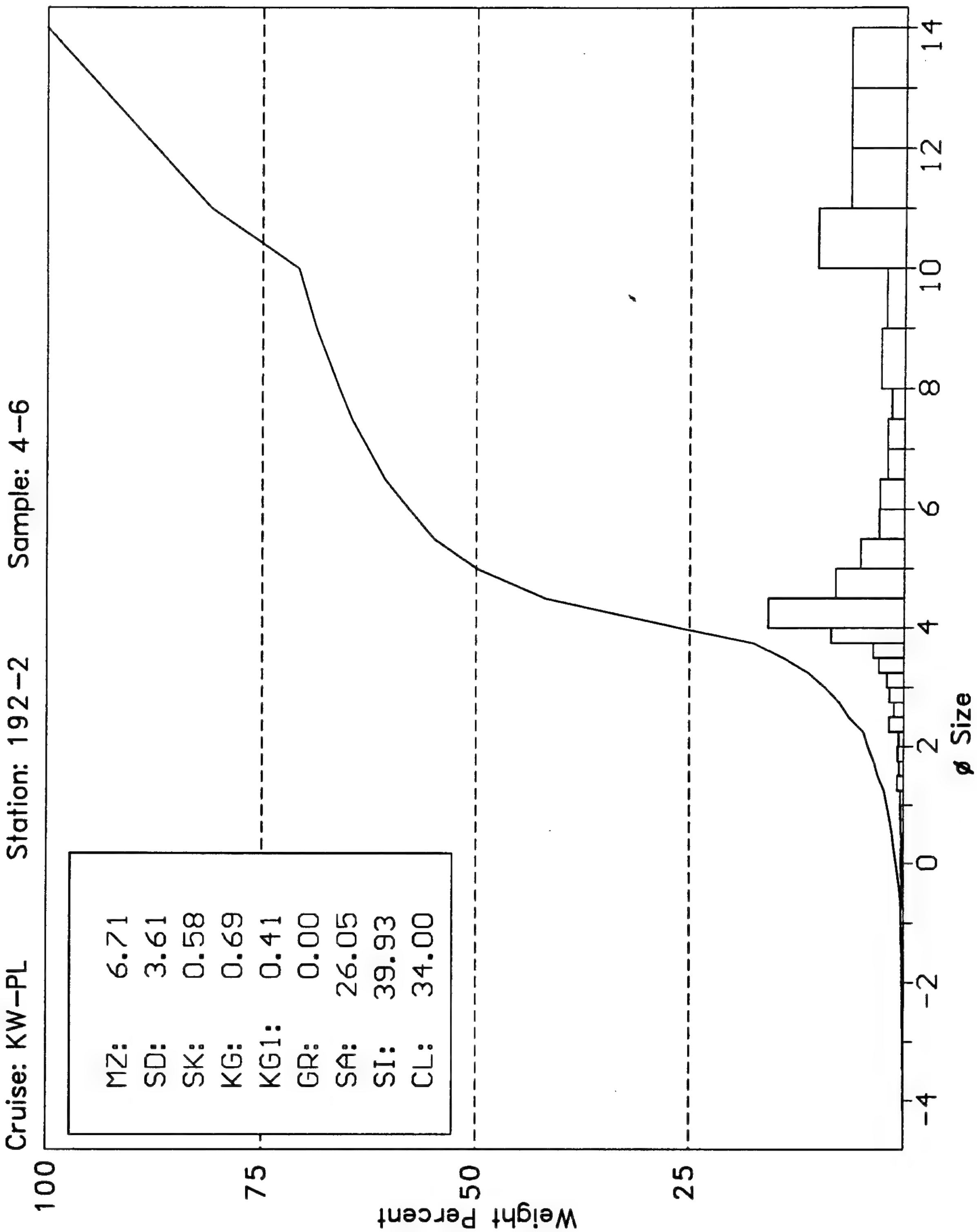
Cruise: KW-PL
Station: 173-1
Sample: 26-28
MZ: 5.82
SD: 4.61
SK: 0.33
KG: 0.83
KG1: 0.45
GR: 6.92
SA: 36.52
SI: 25.04
CL: 31.51
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14


Cruise: KW-PL
Station: 173-1
Sample: 28-30
MZ: 6.12
SD: 4.21
SK: 0.46
KG: 0.73
KG1: 0.42
GR: 1.69
SA: 41.49
SI: 24.61
CL: 32.19
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

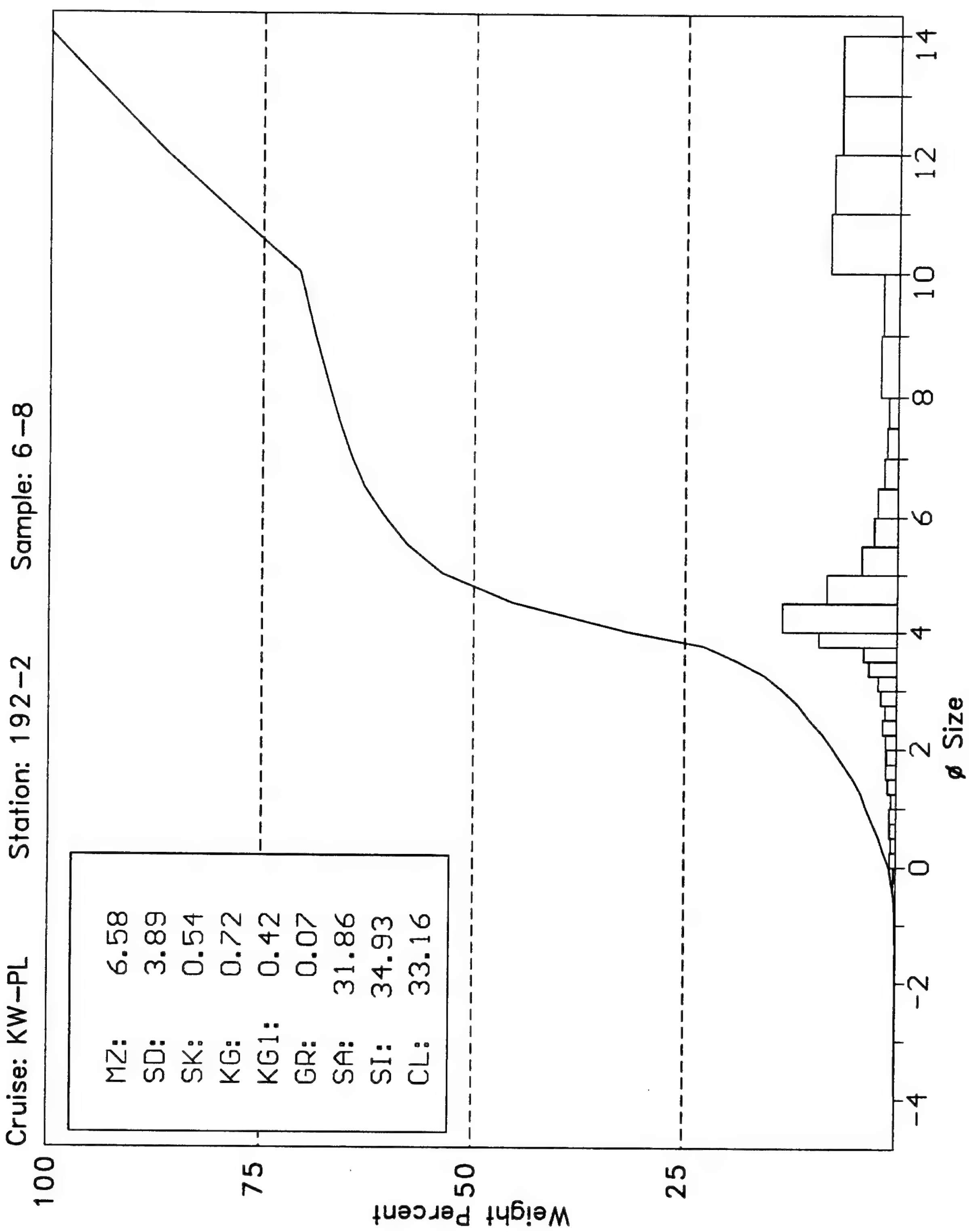


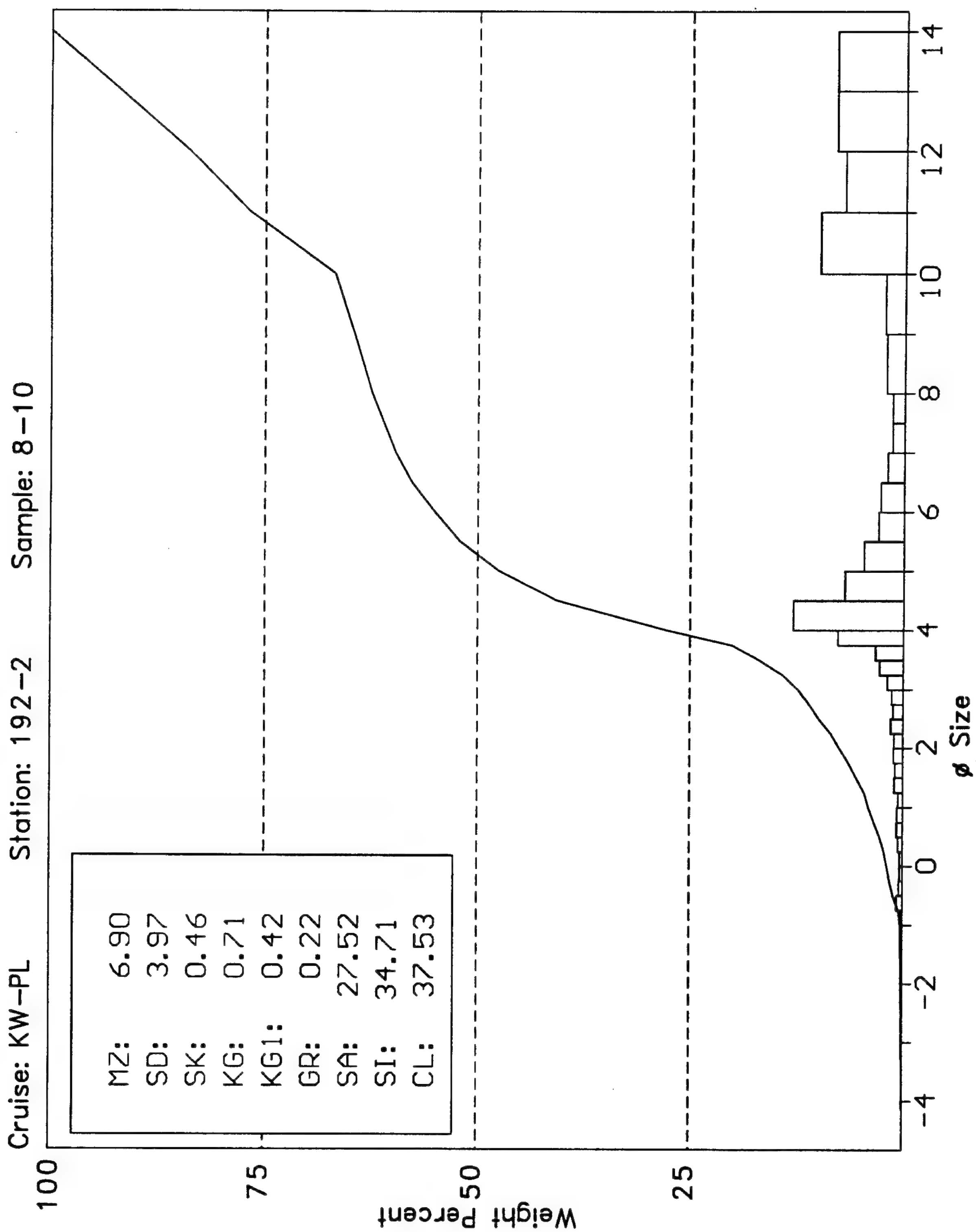
Cruise: KW–PL
Station: 192–2
Sample: 0–2
MZ: 6.73
SD: 3.81
SK: 0.57
KG: 0.70
KG1: 0.41
GR: 0.00
SA: 28.49
SI: 38.76
CL: 32.77
Weight Percent
100
75
50
25
ø Size
−4
−2
0
2
4
6
8
10
12
14

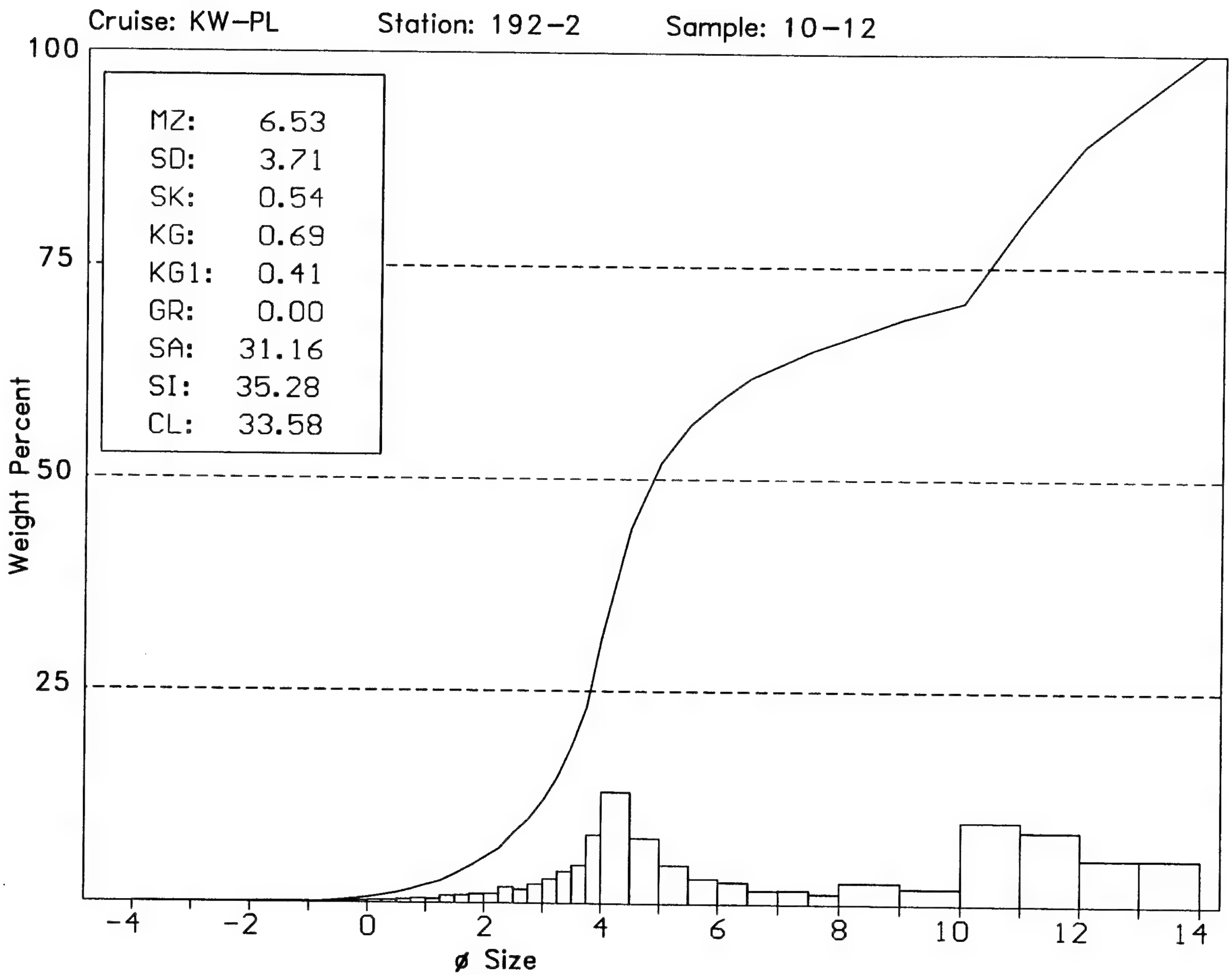

Cruise: KW–PL
Station: 192–2
Sample: 2–4
MZ: 6.16
SD: 3.99
SK: 0.50
KG: 0.76
KG1: 0.43
GR: 0.68
SA: 37.26
SI: 31.85
CL: 30.22
Weight Percent
100
75
50
25
–4
–2
0
2
4
6
8
10
12
14
ø Size

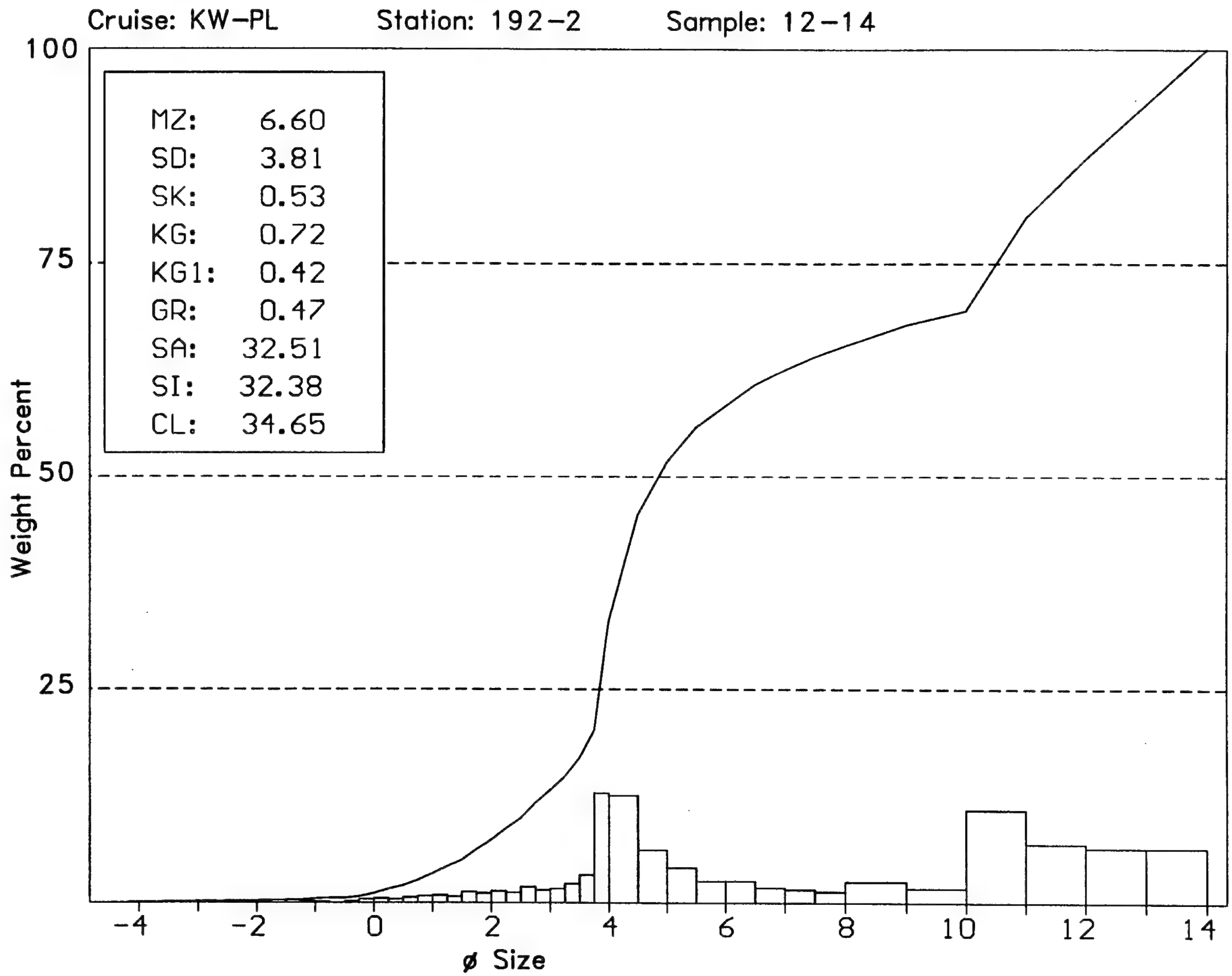


Cruise: KW-PL
Station: 192-2
Sample: 4-6
MZ: 6.71
SD: 3.61
SK: 0.58
KG: 0.69
KG1: 0.41
GR: 0.00
SA: 26.05
SI: 39.93
CL: 34.00
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

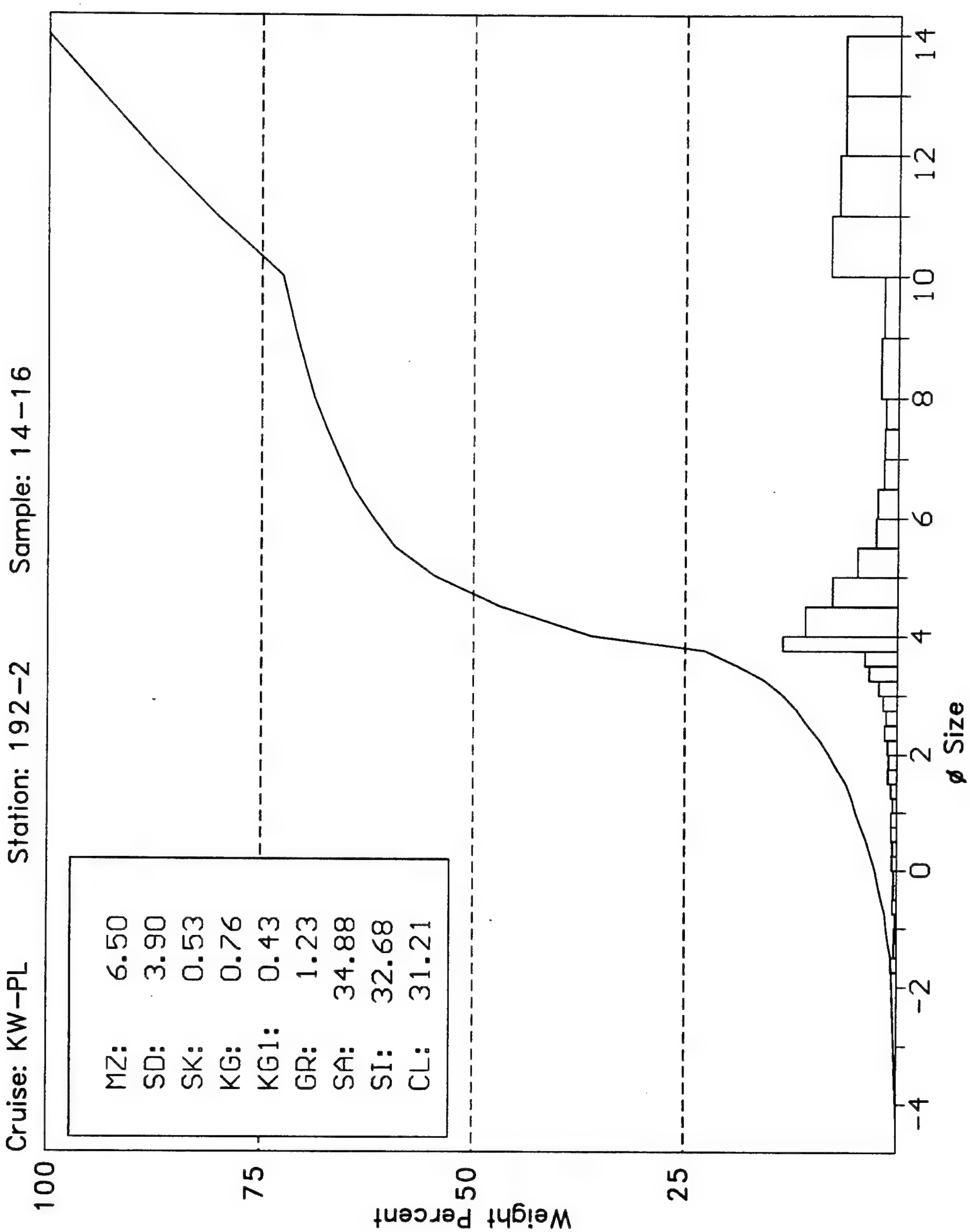

Cruise: KW–PL
Station: 192–2
Sample: 6–8
MZ: 6.58
SD: 3.89
SK: 0.54
KG: 0.72
KG1: 0.42
GR: 0.07
SA: 31.86
SI: 34.93
CL: 33.16
Weight Percent
100
75
50
25
ø Size
–4
–2
0
2
4
6
8
10
12
14

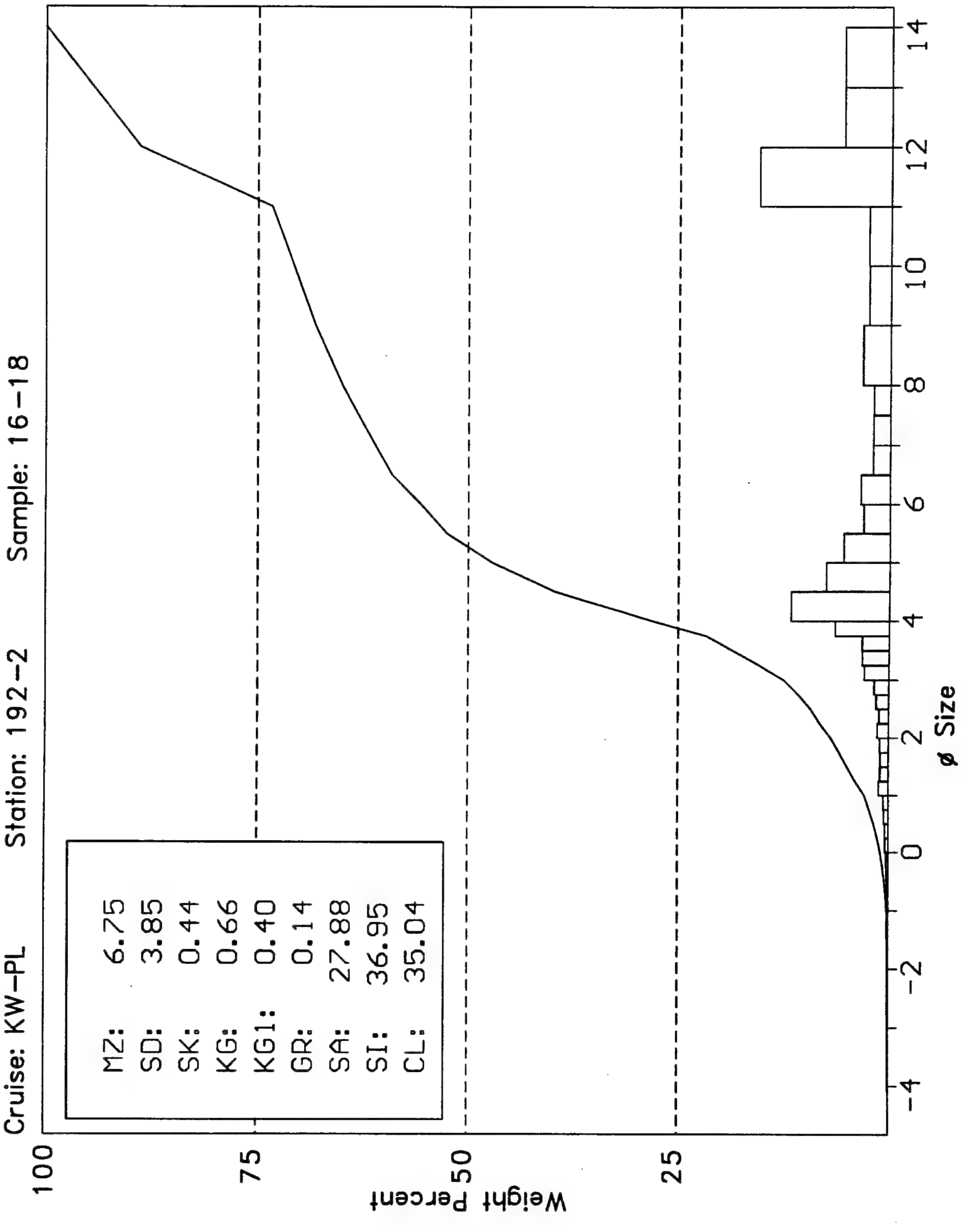

Cruise: KW-PL
Station: 192-2
Sample: 8-10
MZ: 6.90
SD: 3.97
SK: 0.46
KG: 0.71
KG1: 0.42
GR: 0.22
SA: 27.52
SI: 34.71
CL: 37.53
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14


Cruise: KW-PL
Station: 192-2
Sample: 10-12
MZ: 6.53
SD: 3.71
SK: 0.54
KG: 0.69
KG1: 0.41
GR: 0.00
SA: 31.16
SI: 35.28
CL: 33.58
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

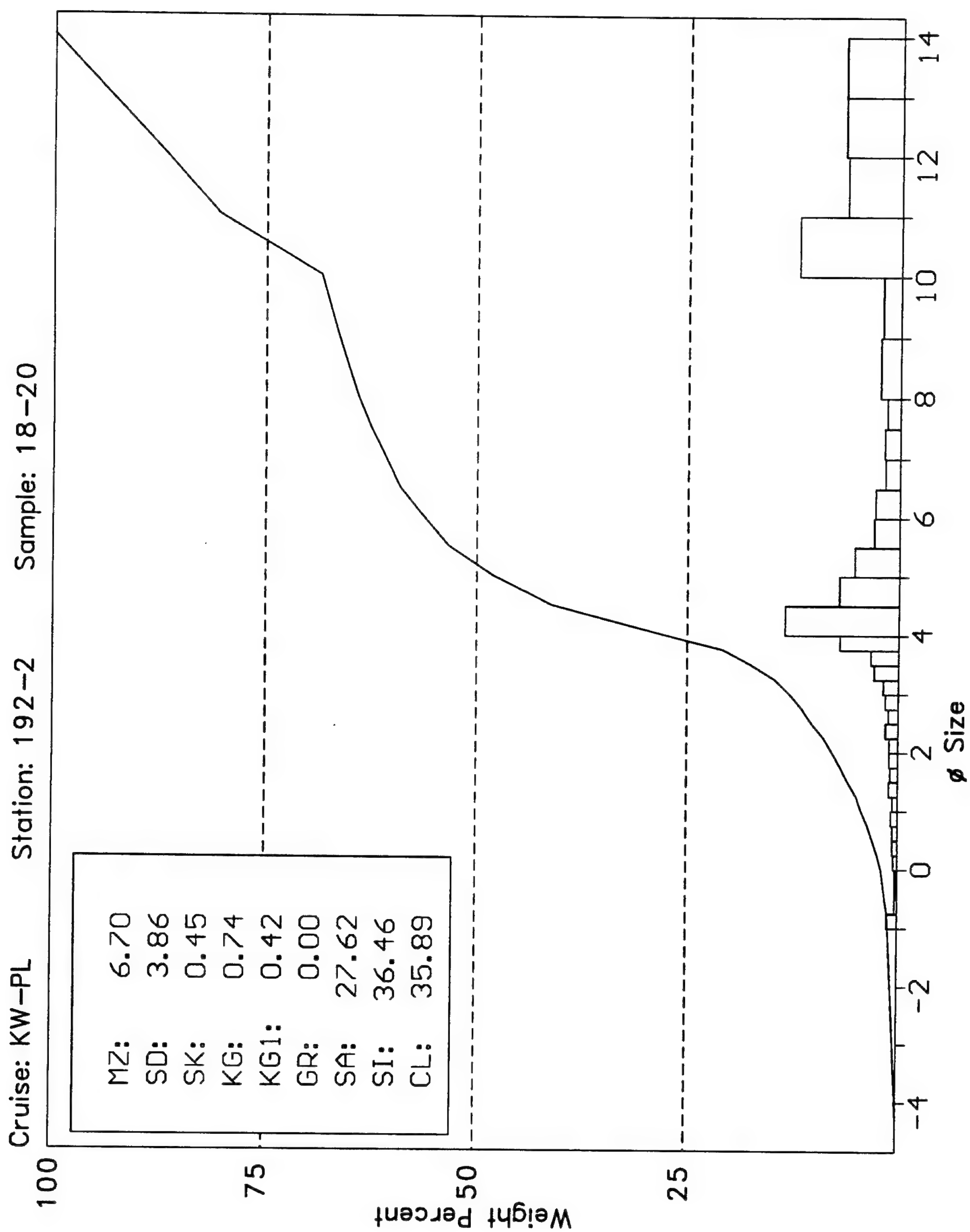


Cruise: KW-PL
Station: 192-2
Sample: 12-14
MZ: 6.60
SD: 3.81
SK: 0.53
KG: 0.72
KG1: 0.42
GR: 0.47
SA: 32.51
SI: 32.38
CL: 34.65
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

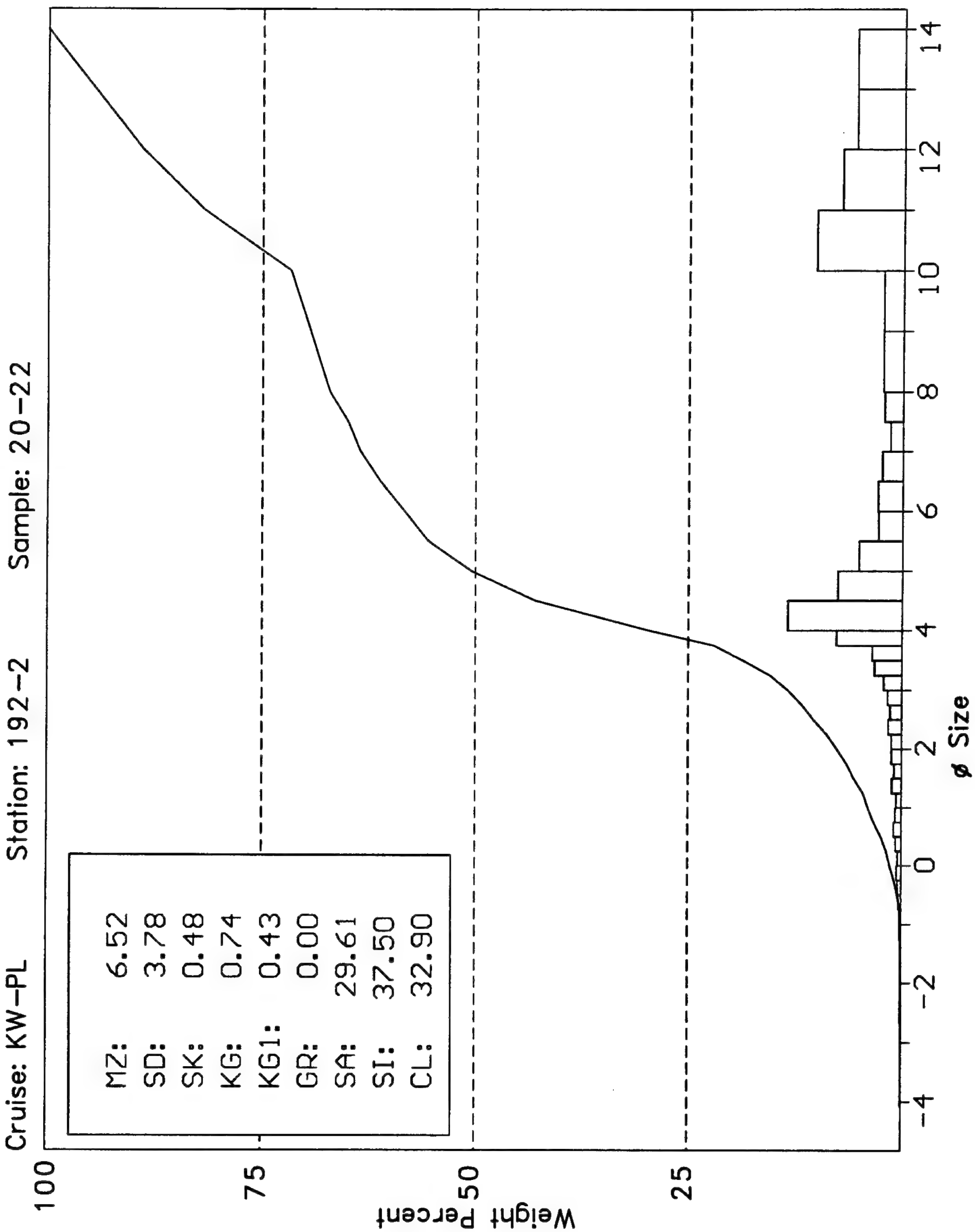

Cruise: KW-PL
Station: 192-2
Sample: 14-16
MZ: 6.50
SD: 3.90
SK: 0.53
KG: 0.76
KG1: 0.43
GR: 1.23
SA: 34.88
SI: 32.68
CL: 31.21
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size



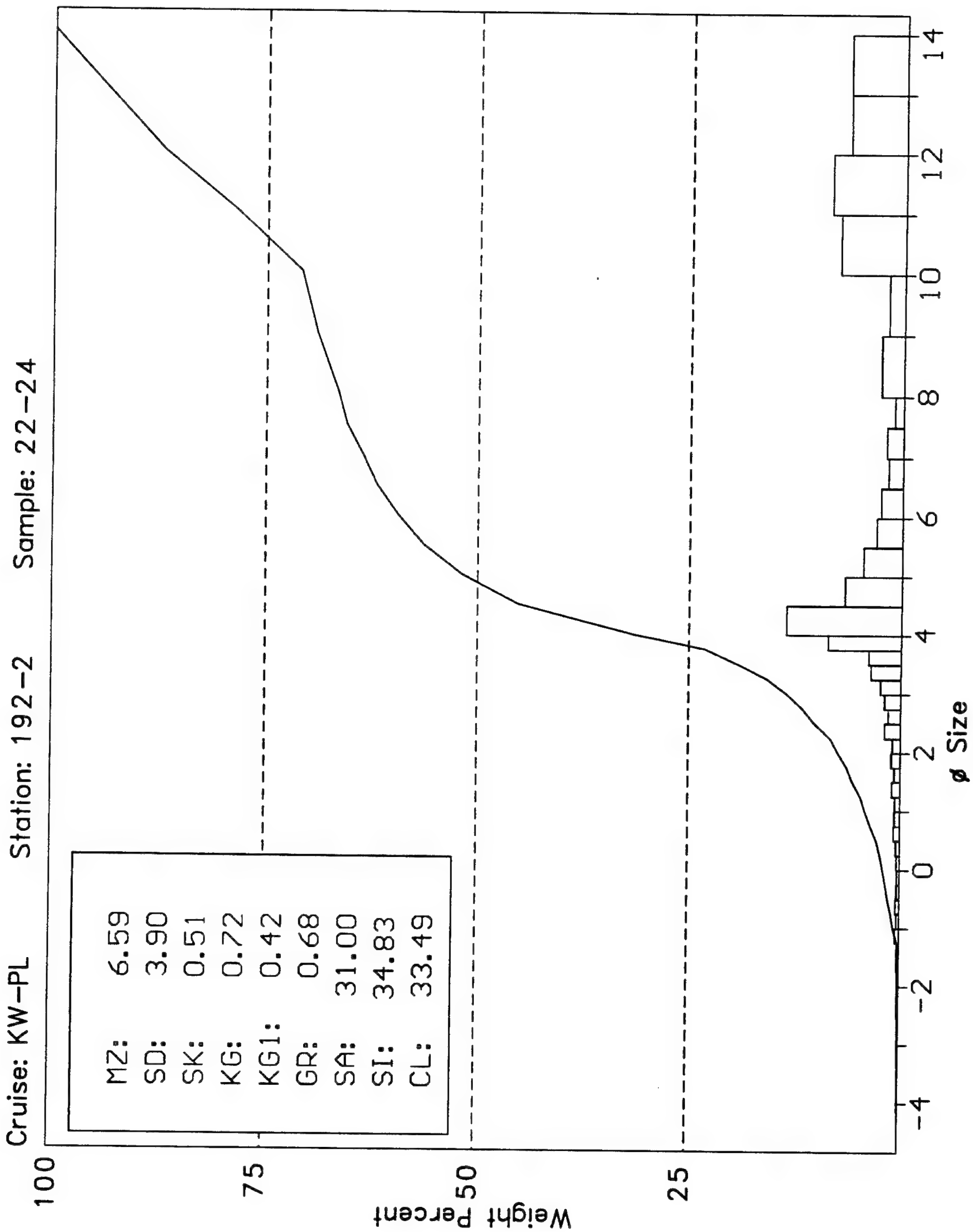
Cruise: KW-PL
Station: 192-2
Sample: 16-18
MZ: 6.75
SD: 3.85
SK: 0.44
KG: 0.66
KG1: 0.40
GR: 0.14
SA: 27.88
SI: 36.95
CL: 35.04
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

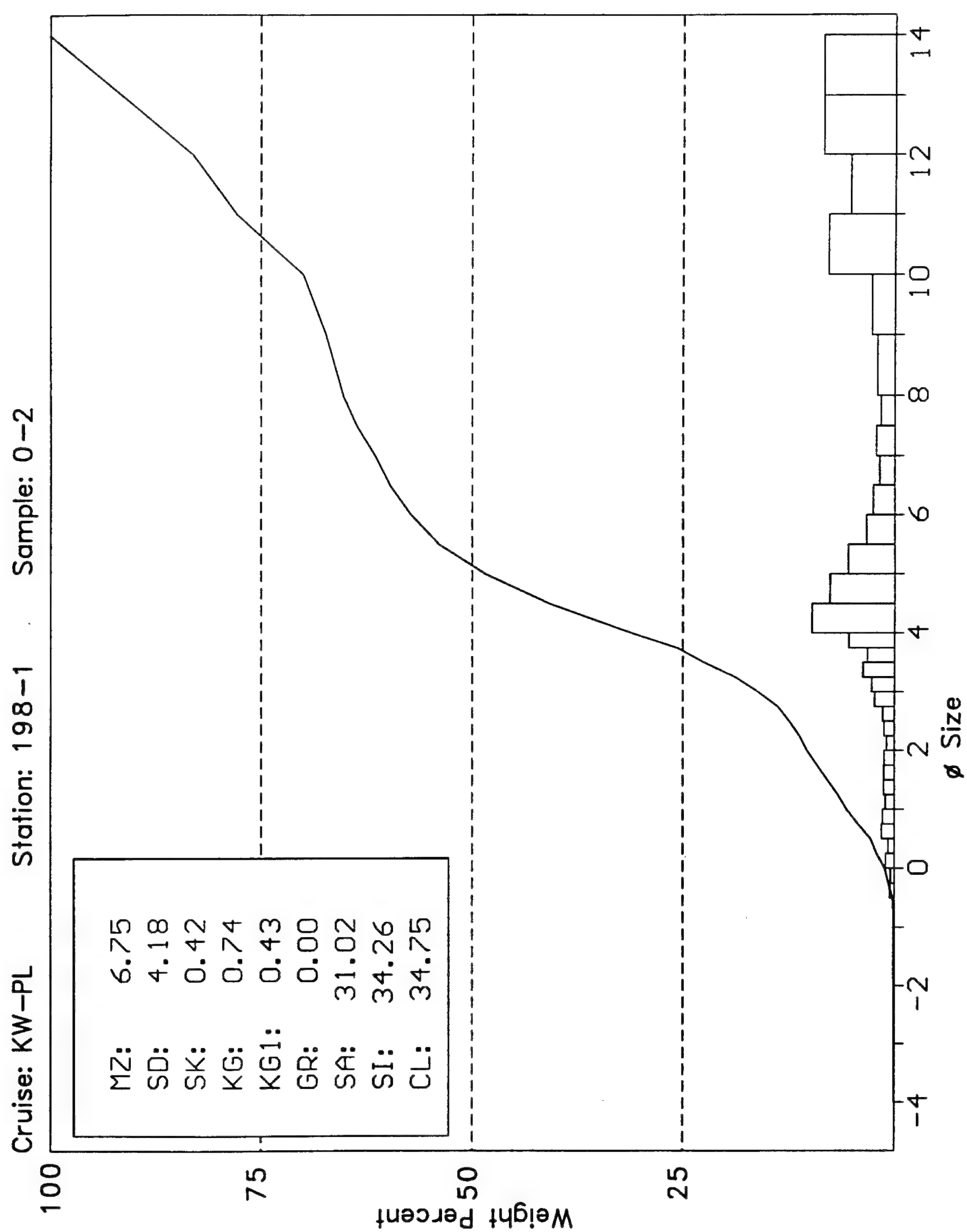


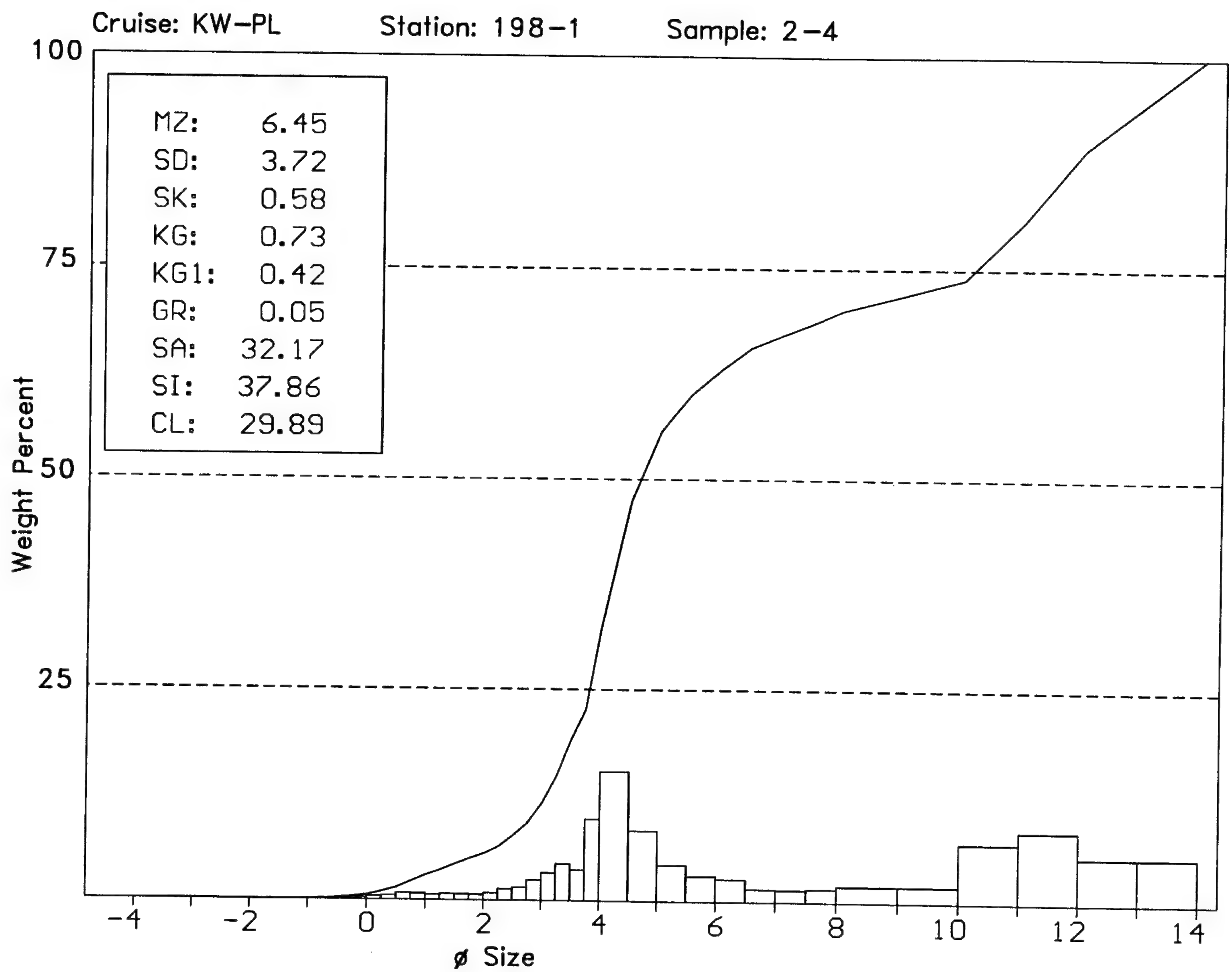
Cruise: KW–PL
Station: 192–2
Sample: 18–20
MZ: 6.70
SD: 3.86
SK: 0.45
KG: 0.74
KG1: 0.42
GR: 0.00
SA: 27.62
SI: 36.46
CL: 35.89
100
75
50
25
Weight Percent
–4
–2
0
2
4
6
8
10
12
14
ø Size

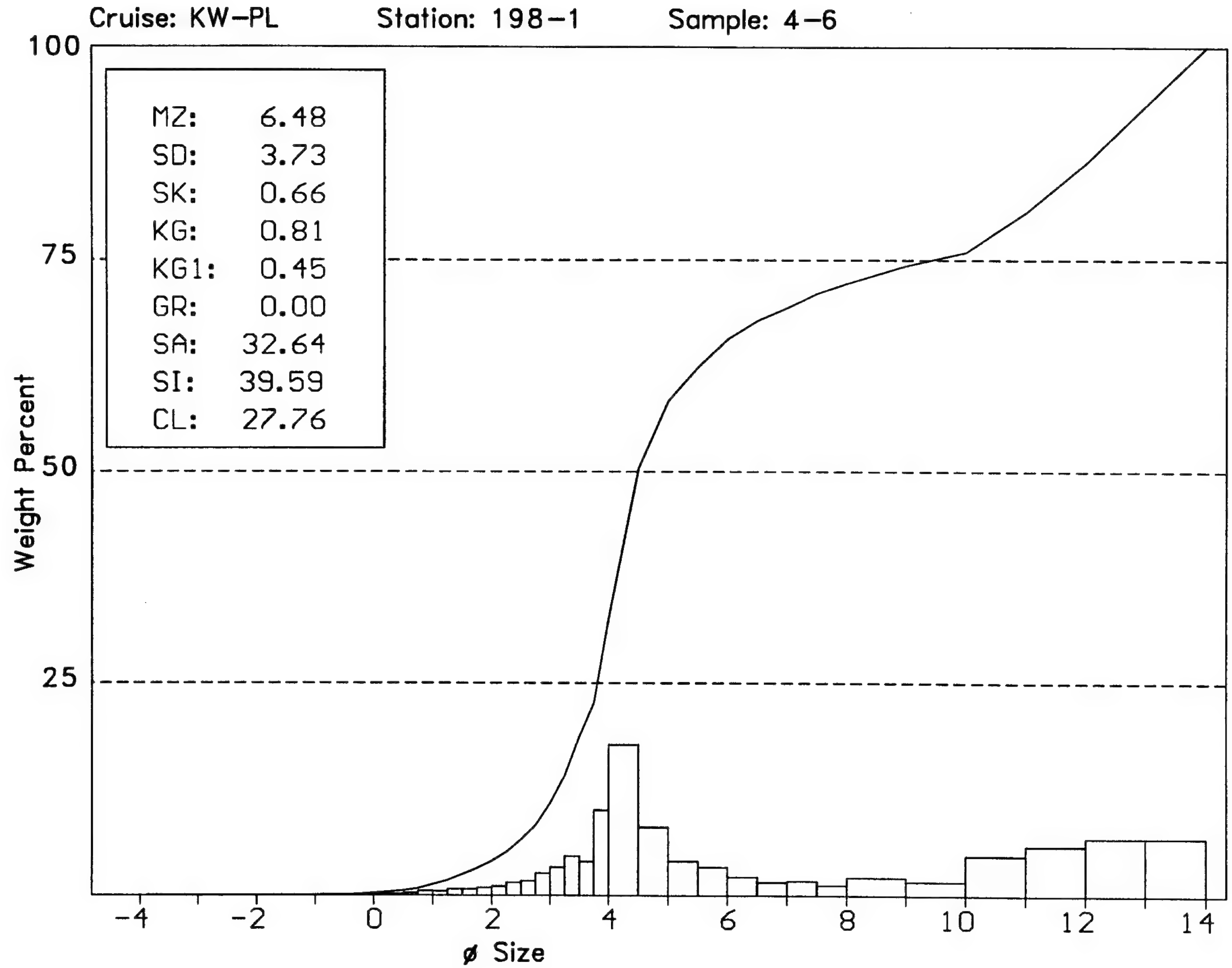


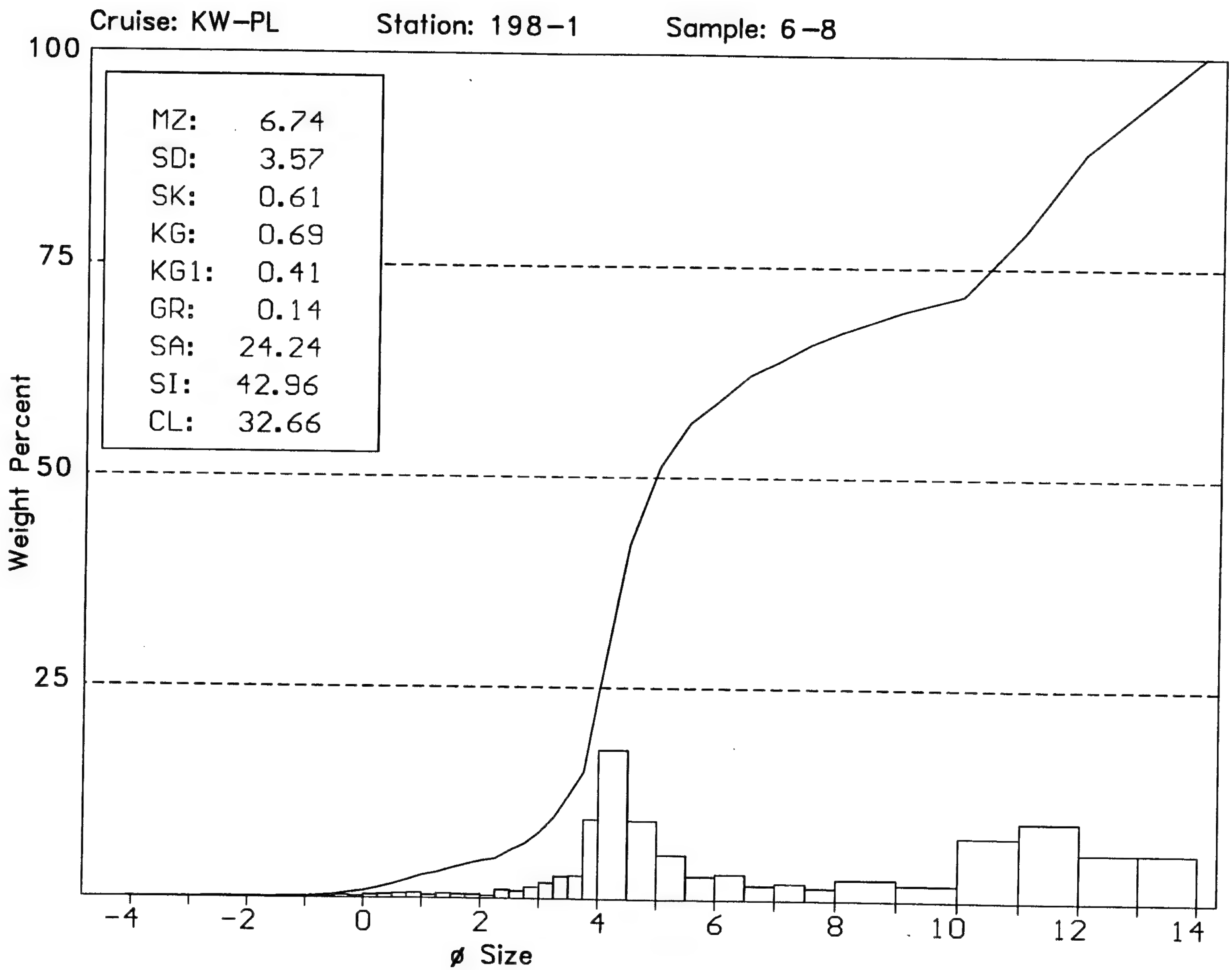
Cruise: KW-PL
Station: 192-2
Sample: 20-22
MZ: 6.52
SD: 3.78
SK: 0.48
KG: 0.74
KG1: 0.43
GR: 0.00
SA: 29.61
SI: 37.50
CL: 32.90
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

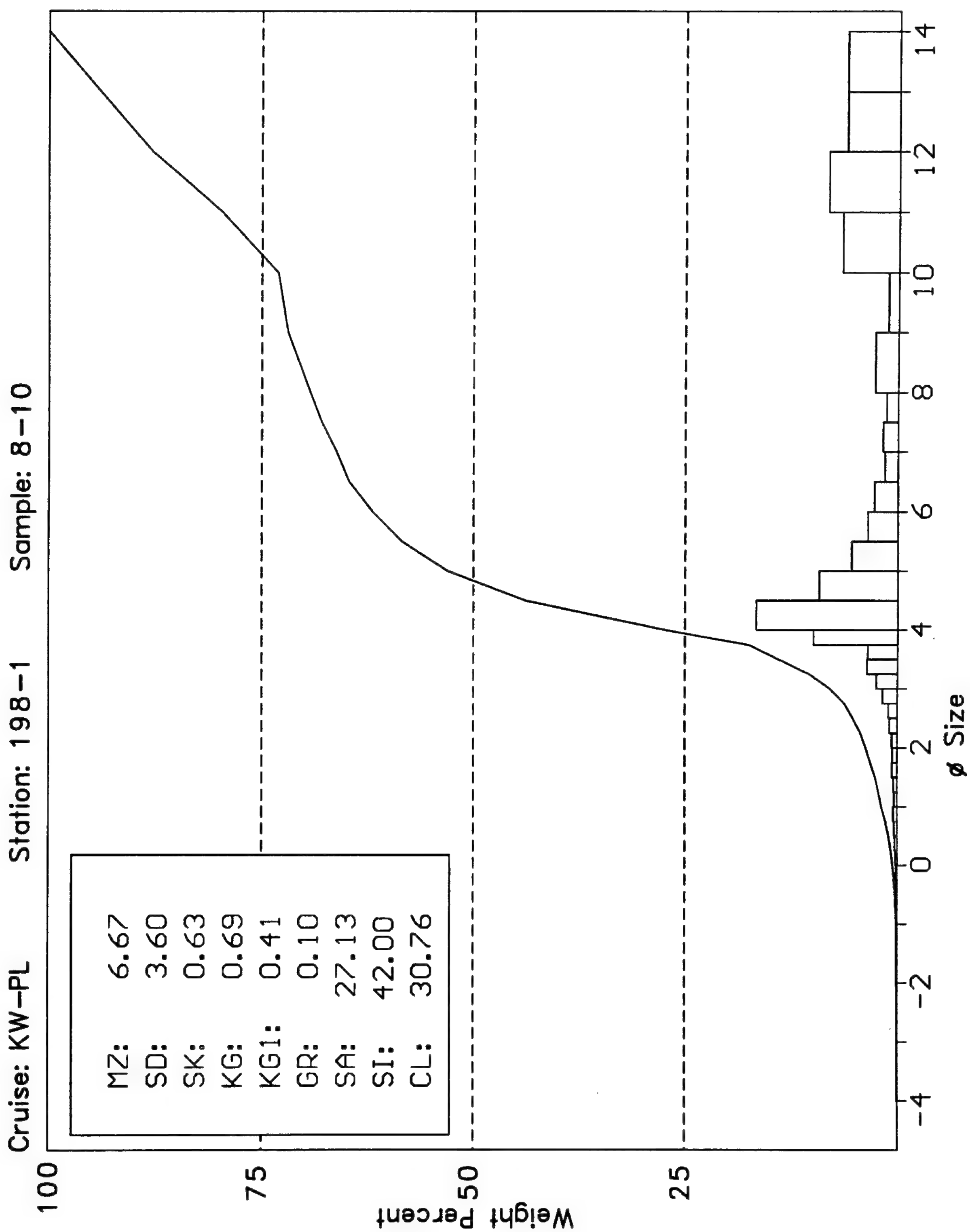

Cruise: KW-PL
Station: 192-2
Sample: 22-24
MZ: 6.59
SD: 3.90
SK: 0.51
KG: 0.72
KG1: 0.42
GR: 0.68
SA: 31.00
SI: 34.83
CL: 33.49
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size


Cruise: KW–PL
Station: 198–1
Sample: 0–2
MZ: 6.75
SD: 4.18
SK: 0.42
KG: 0.74
KG1: 0.43
GR: 0.00
SA: 31.02
SI: 34.26
CL: 34.75
Weight Percent
100
75
50
25
ø Size
−4
−2
0
2
4
6
8
10
12
14

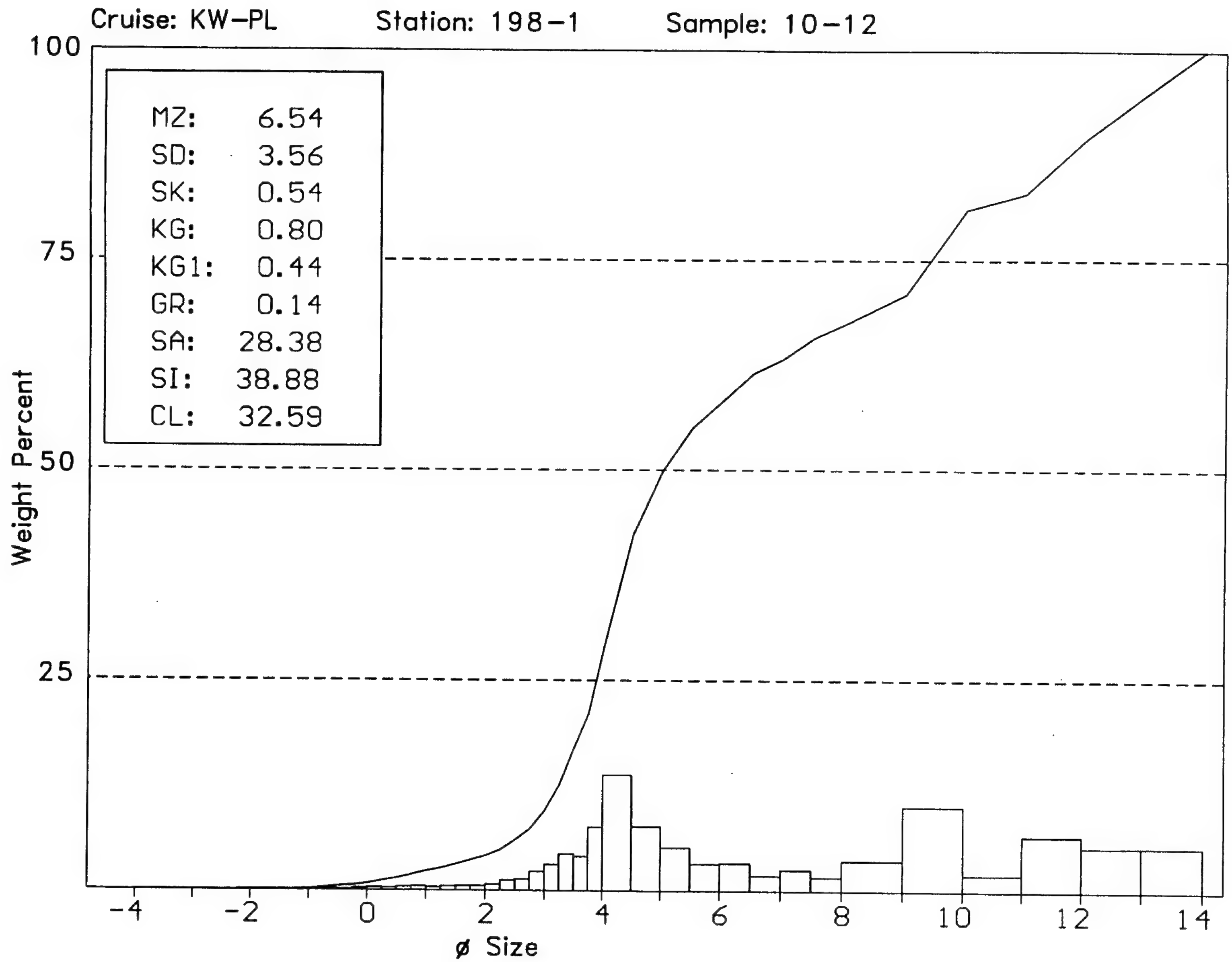

Cruise: KW–PL
Station: 198–1
Sample: 2–4
MZ: 6.45
SD: 3.72
SK: 0.58
KG: 0.73
KG1: 0.42
GR: 0.05
SA: 32.17
SI: 37.86
CL: 29.89
100
75
50
25
Weight Percent
–4
–2
0
2
4
6
8
10
12
14
ø Size

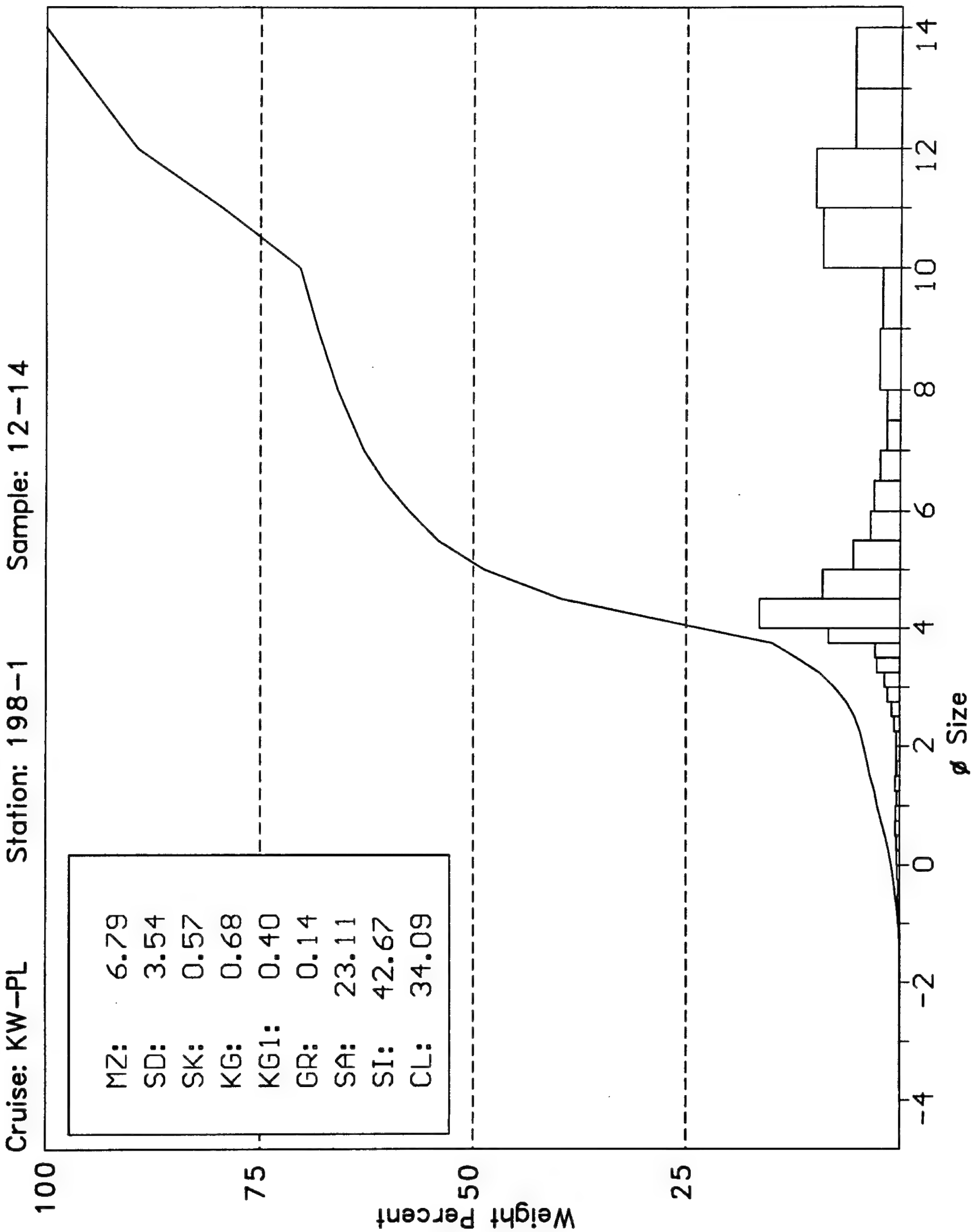

Cruise: KW-PL
Station: 198-1
Sample: 4-6
MZ: 6.48
SD: 3.73
SK: 0.66
KG: 0.81
KG1: 0.45
GR: 0.00
SA: 32.64
SI: 39.59
CL: 27.76
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

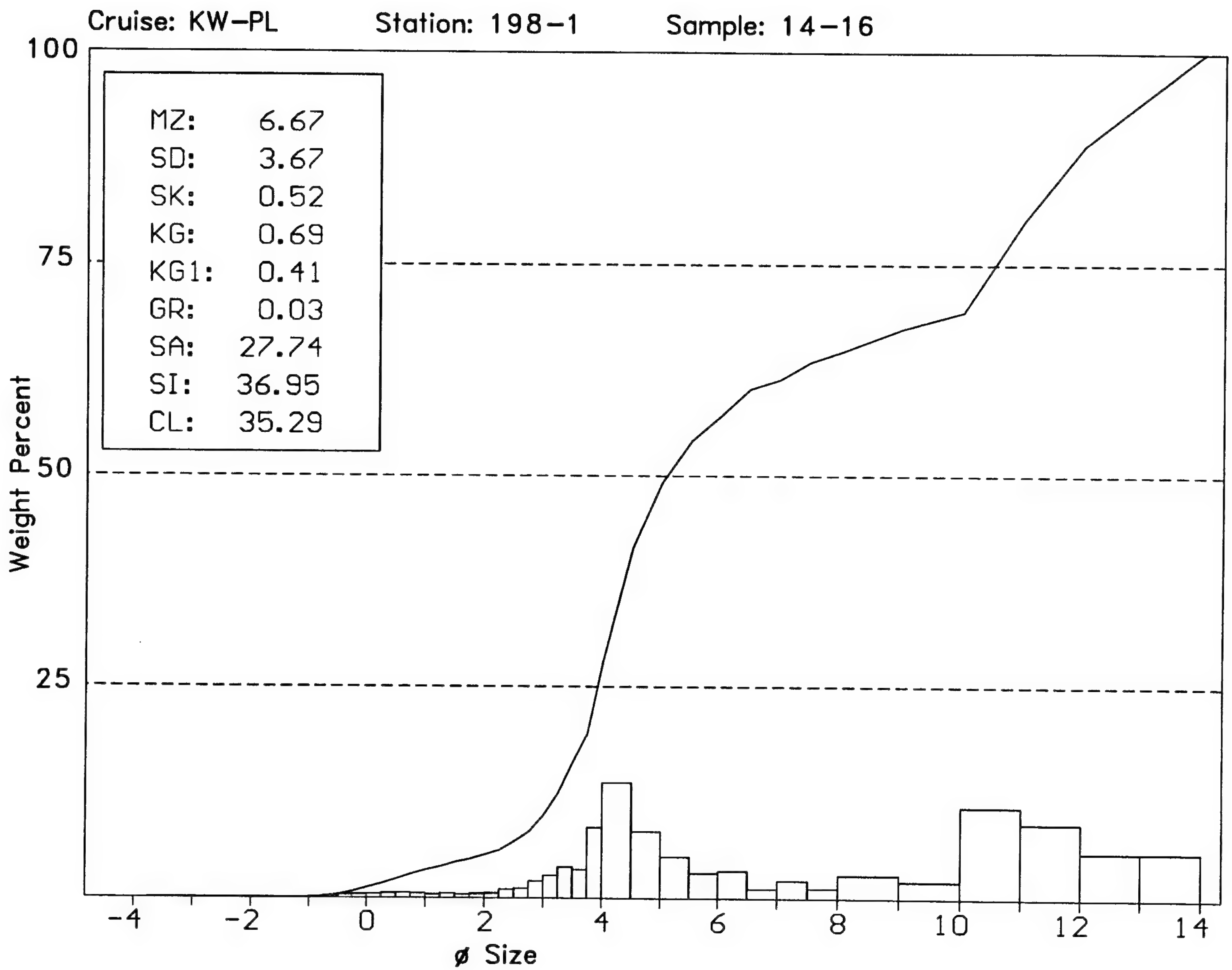

Cruise: KW-PL
Station: 198-1
Sample: 6-8
MZ: 6.74
SD: 3.57
SK: 0.61
KG: 0.69
KG1: 0.41
GR: 0.14
SA: 24.24
SI: 42.96
CL: 32.66
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size



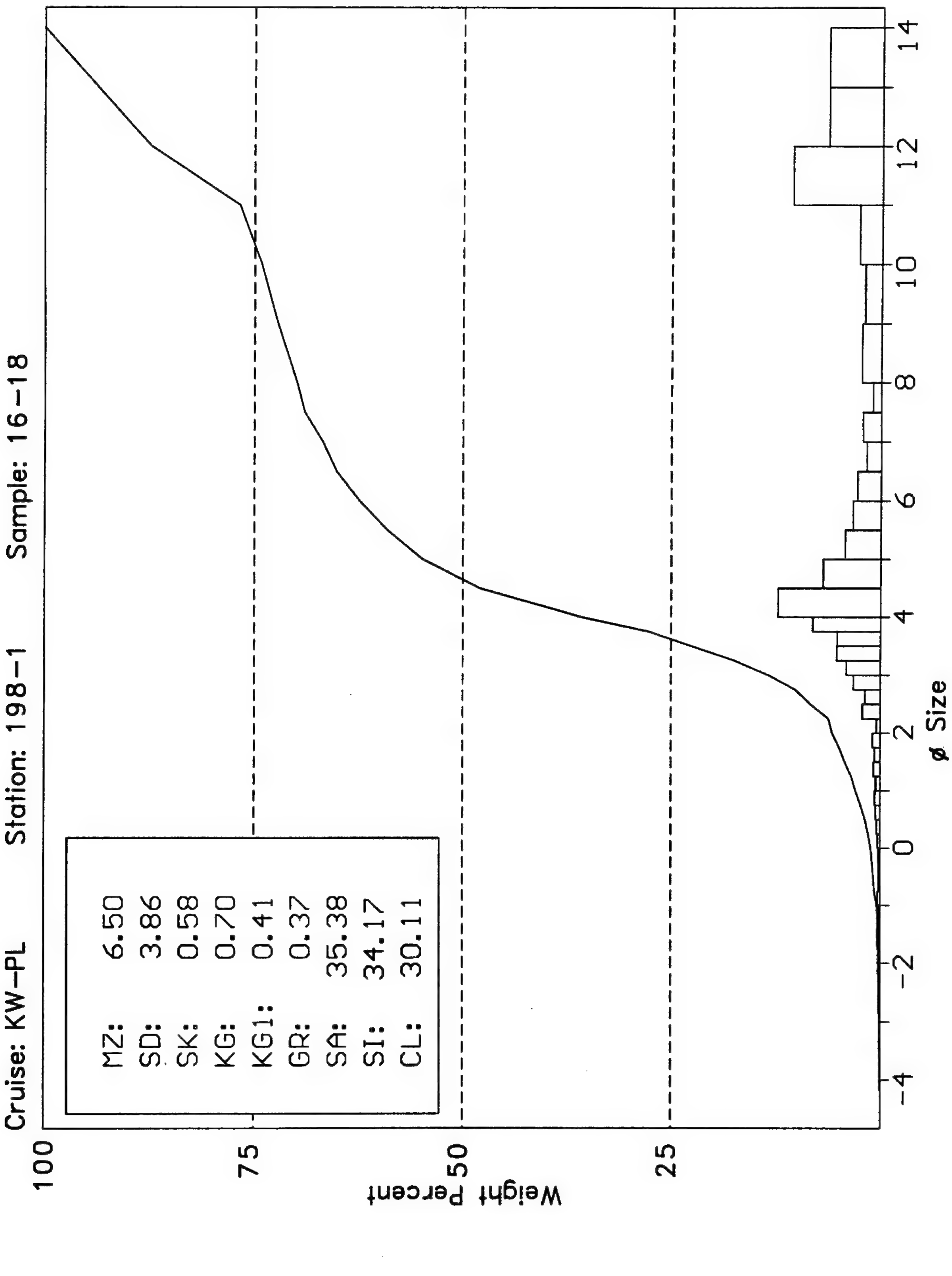
Cruise: KW-PL
Station: 198-1
Sample: 8-10
MZ: 6.67
SD: 3.60
SK: 0.63
KG: 0.69
KG1: 0.41
GR: 0.10
SA: 27.13
SI: 42.00
CL: 30.76
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size


Cruise: KW-PL
Station: 198-1
Sample: 10-12
MZ: 6.54
SD: 3.56
SK: 0.54
KG: 0.80
KG1: 0.44
GR: 0.14
SA: 28.38
SI: 38.88
CL: 32.59
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

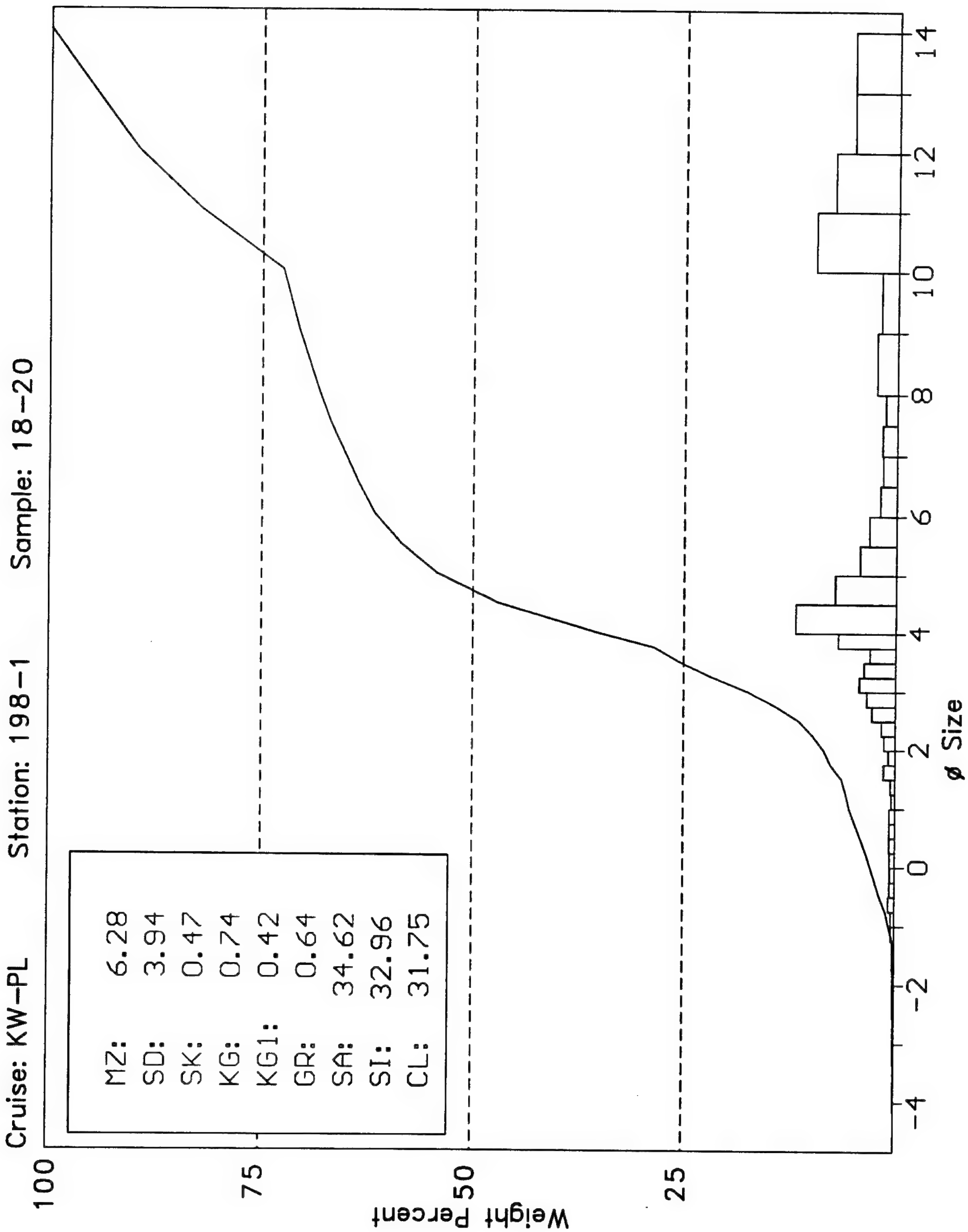

Cruise: KW-PL Station: 198-1 Sample: 12-14
MZ: 6.79
SD: 3.54
SK: 0.57
KG: 0.68
KG1: 0.40
GR: 0.14
SA: 23.11
SI: 42.67
CL: 34.09
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

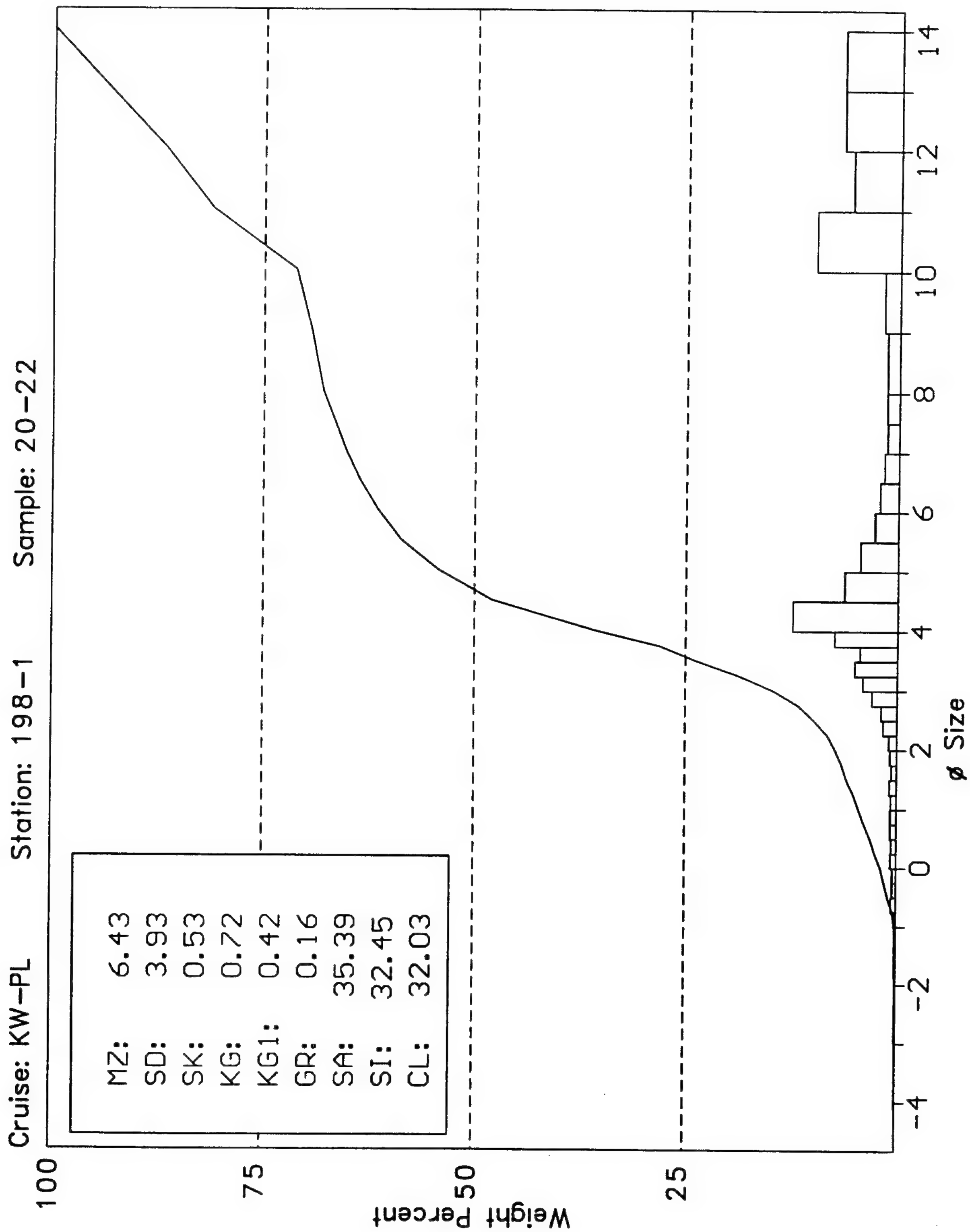


Cruise: KW-PL
Station: 198-1
Sample: 14-16
MZ: 6.67
SD: 3.67
SK: 0.52
KG: 0.69
KG1: 0.41
GR: 0.03
SA: 27.74
SI: 36.95
CL: 35.29
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

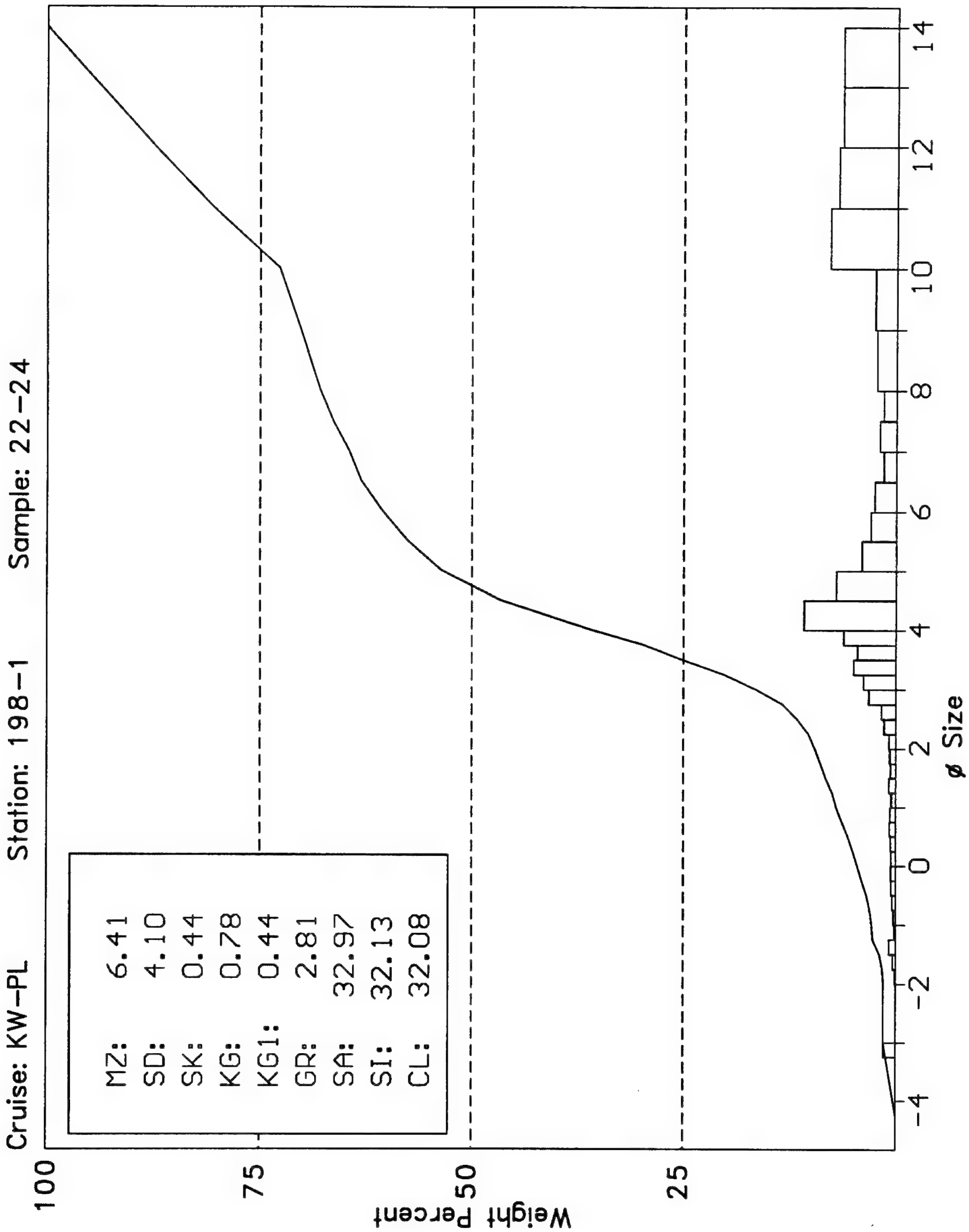


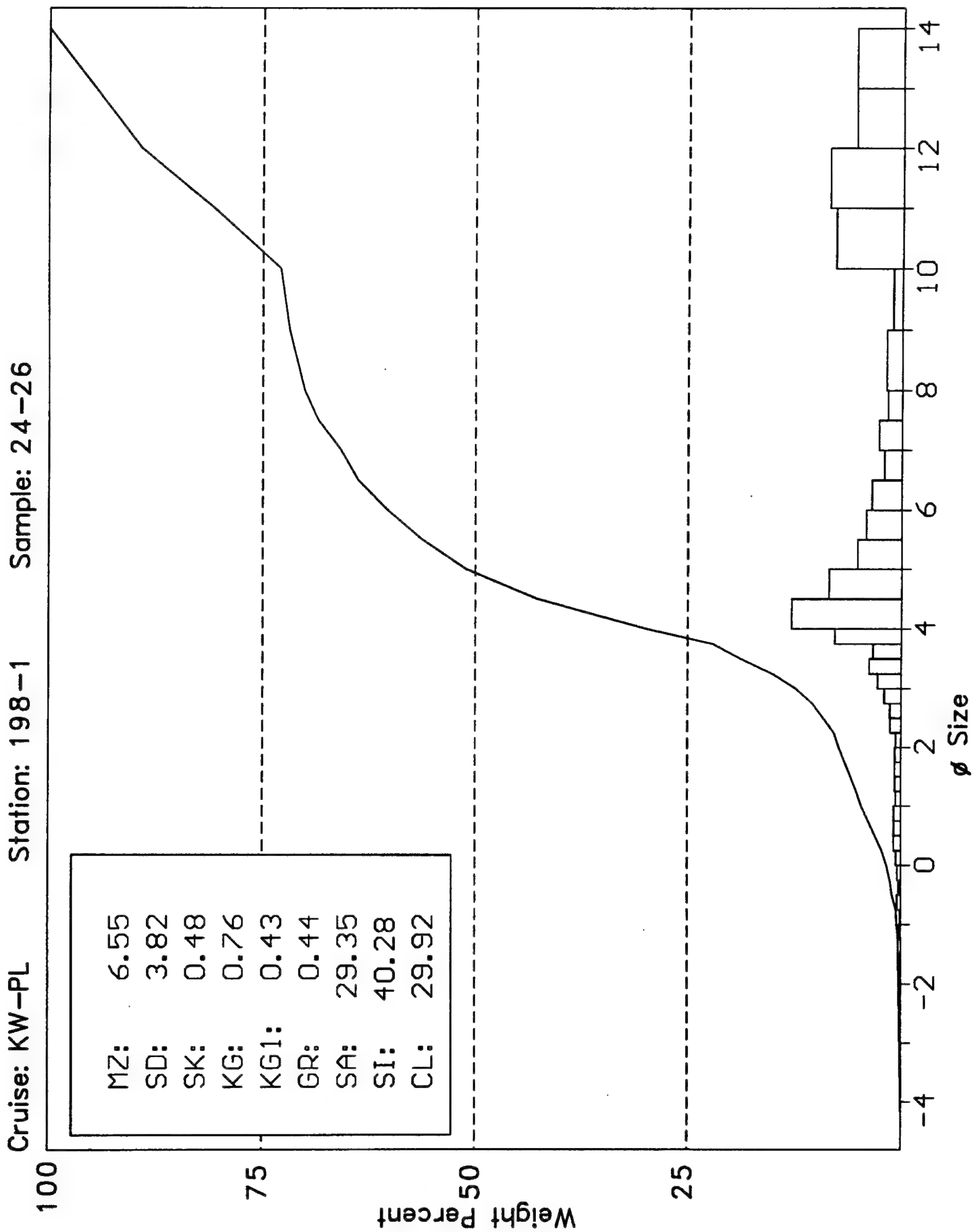
Cruise: KW-PL
Station: 198-1
Sample: 16-18
MZ: 6.50
SD: 3.86
SK: 0.58
KG: 0.70
KG1: 0.41
GR: 0.37
SA: 35.38
SI: 34.17
CL: 30.11
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size


Cruise: KW-PL
Station: 198-1
Sample: 18-20
MZ: 6.28
SD: 3.94
SK: 0.47
KG: 0.74
KG1: 0.42
GR: 0.64
SA: 34.62
SI: 32.96
CL: 31.75
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size



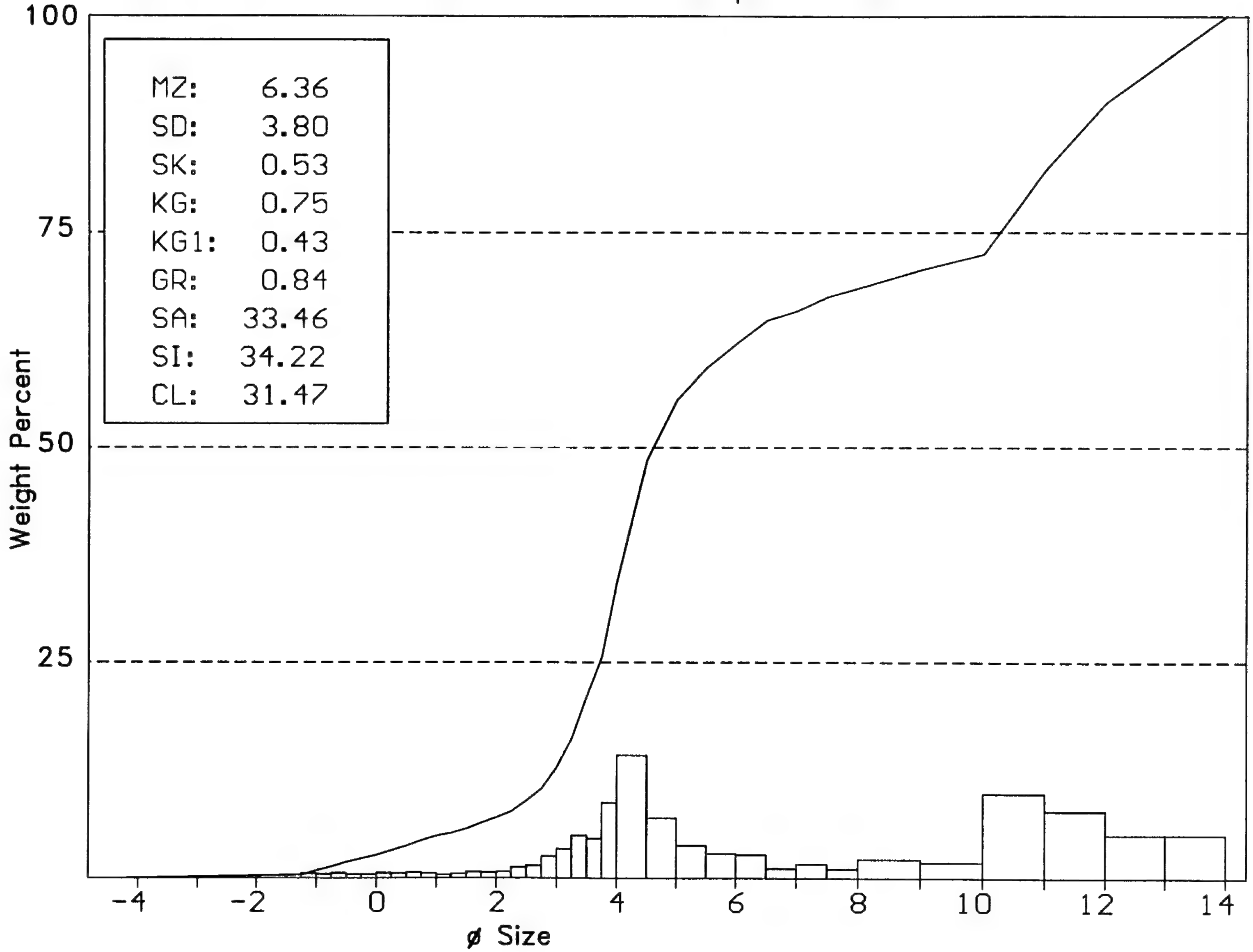
Cruise: KW-PL
Station: 198-1
Sample: 20-22
MZ: 6.43
SD: 3.93
SK: 0.53
KG: 0.72
KG1: 0.42
GR: 0.16
SA: 35.39
SI: 32.45
CL: 32.03
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

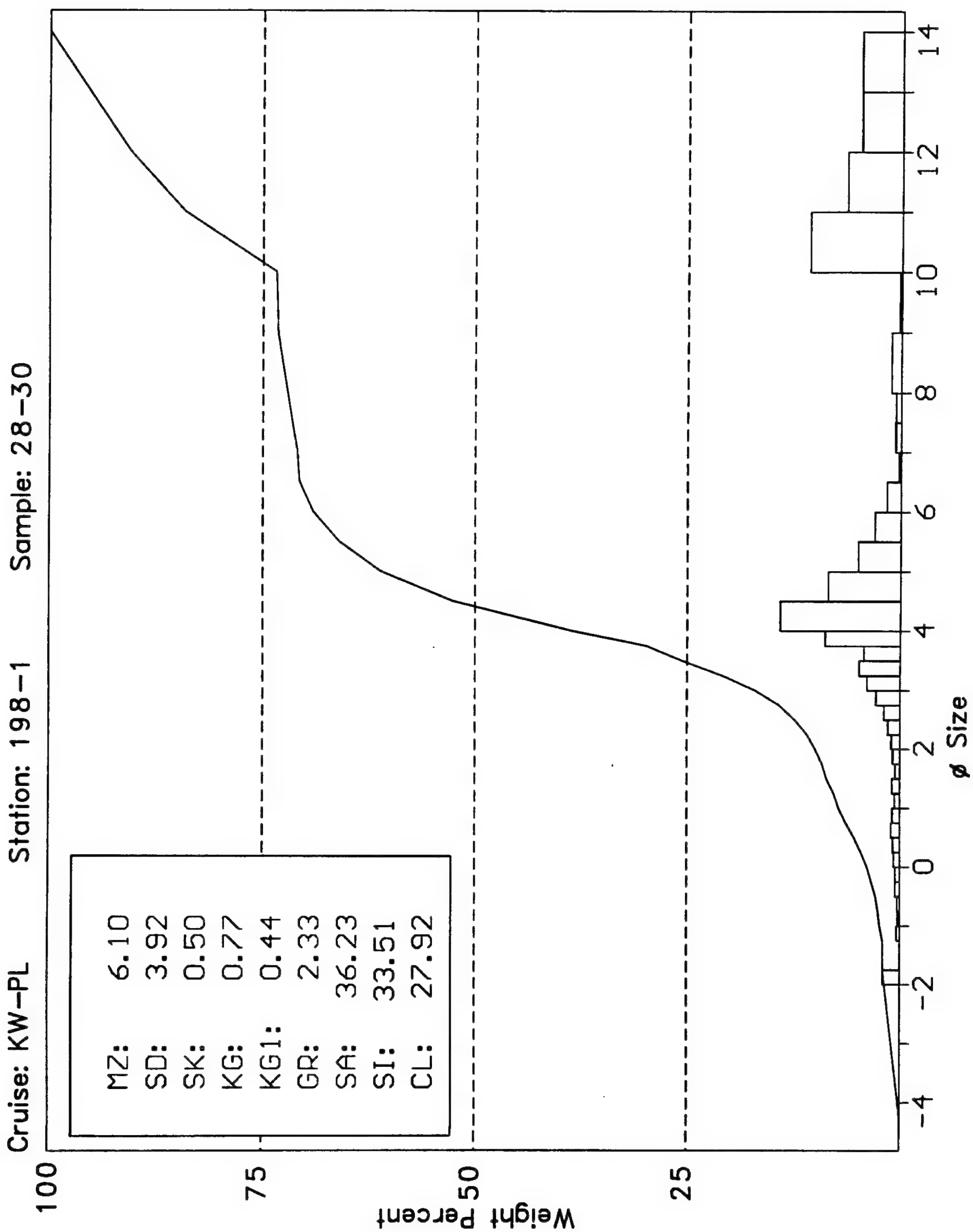

Cruise: KW-PL
Station: 198-1
Sample: 22-24
MZ: 6.41
SD: 4.10
SK: 0.44
KG: 0.78
KG1: 0.44
GR: 2.81
SA: 32.97
SI: 32.13
CL: 32.08
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size



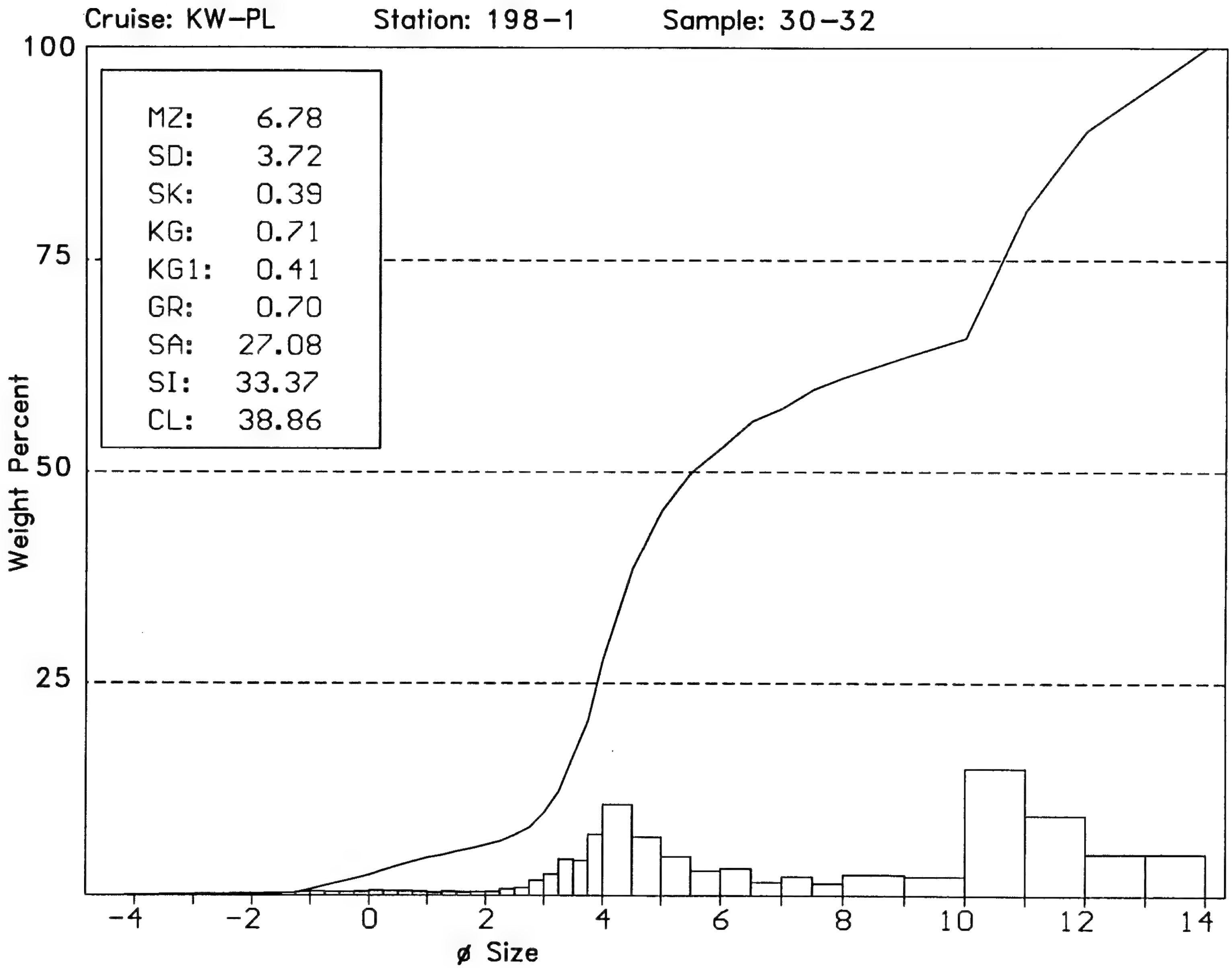
Cruise: KW-PL
Station: 198-1
Sample: 24-26
MZ: 6.55
SD: 3.82
SK: 0.48
KG: 0.76
KG1: 0.43
GR: 0.44
SA: 29.35
SI: 40.28
CL: 29.92
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

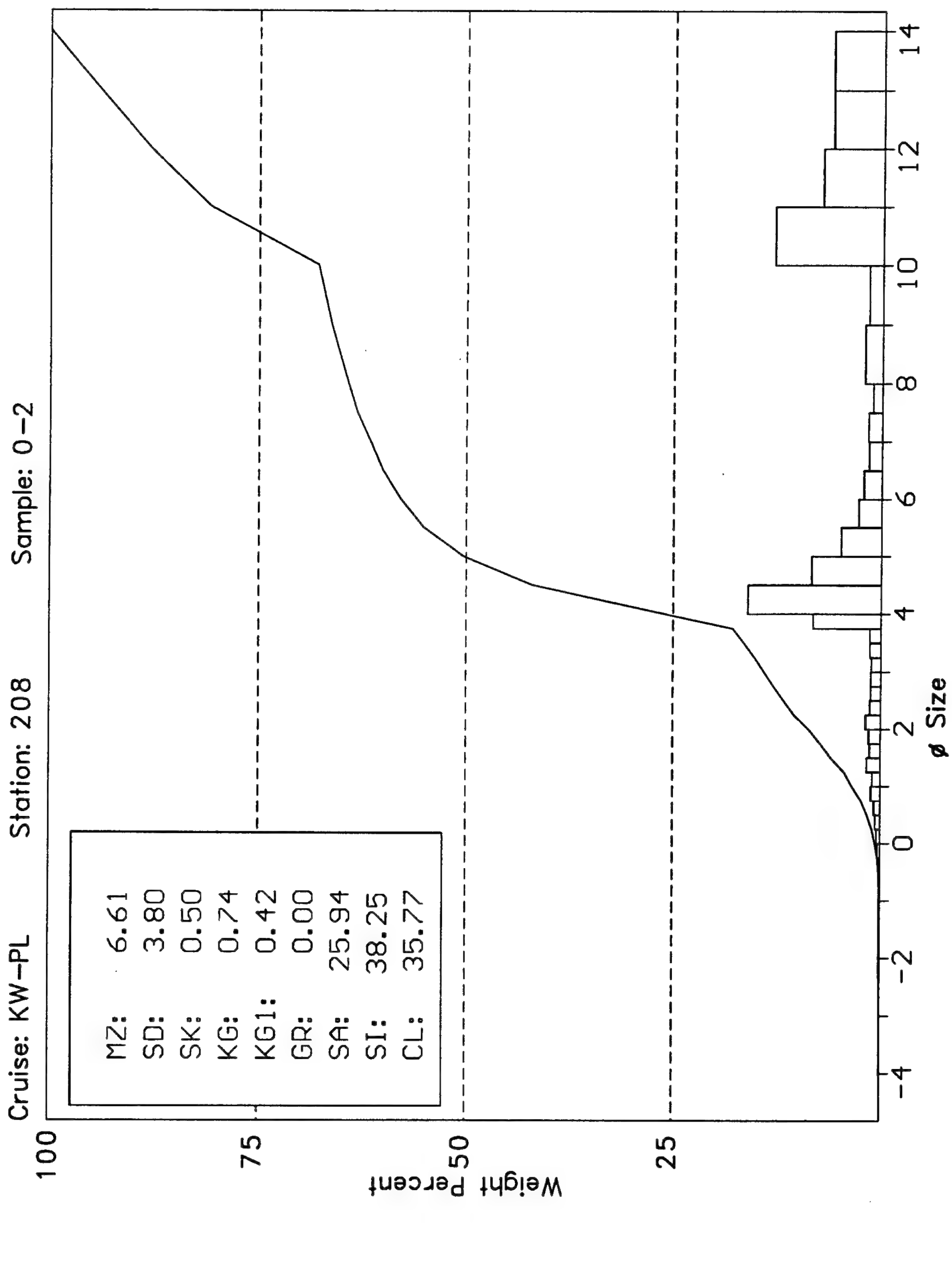
Cruise: KW-PL Station: 198-1 Sample: 26-28

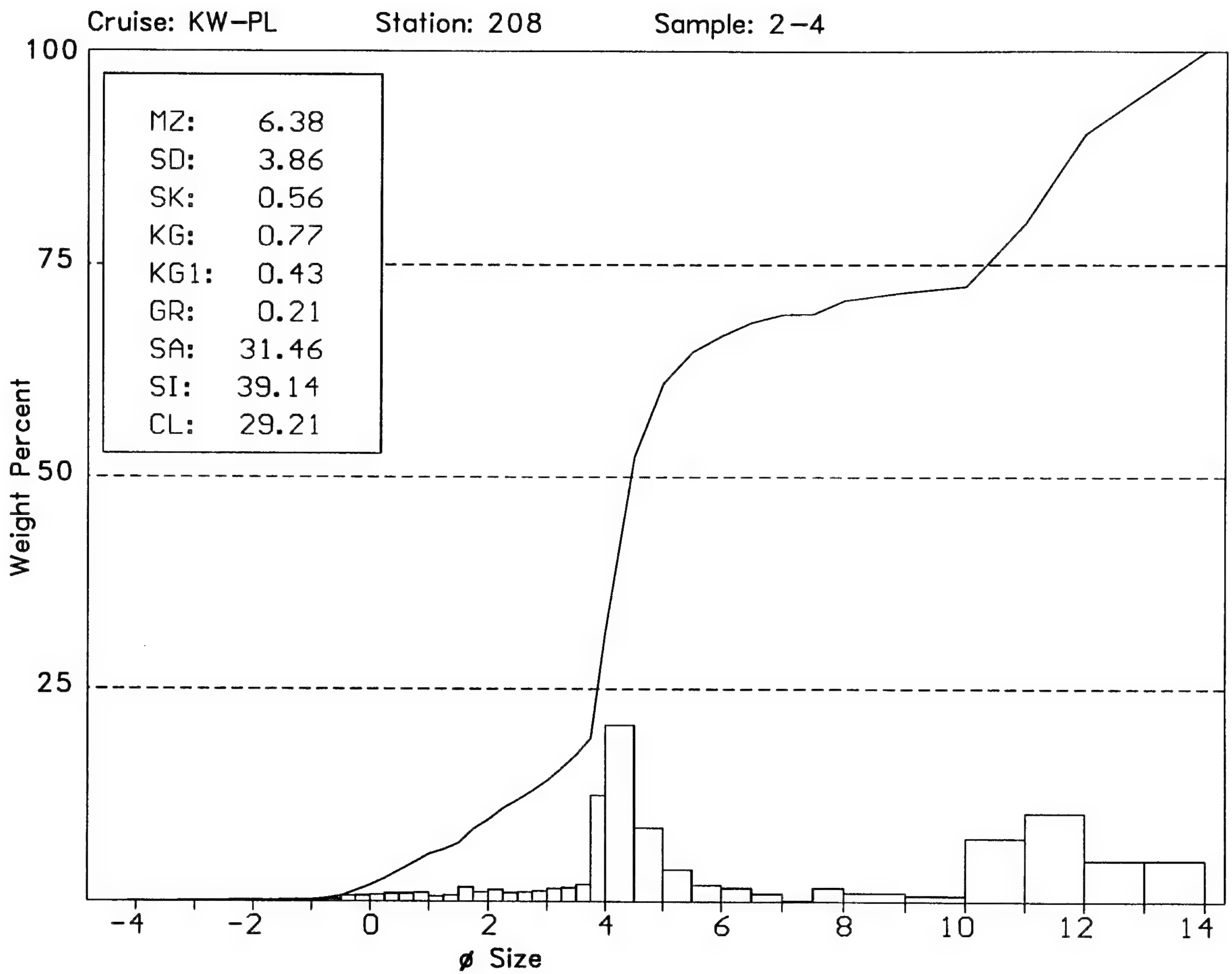




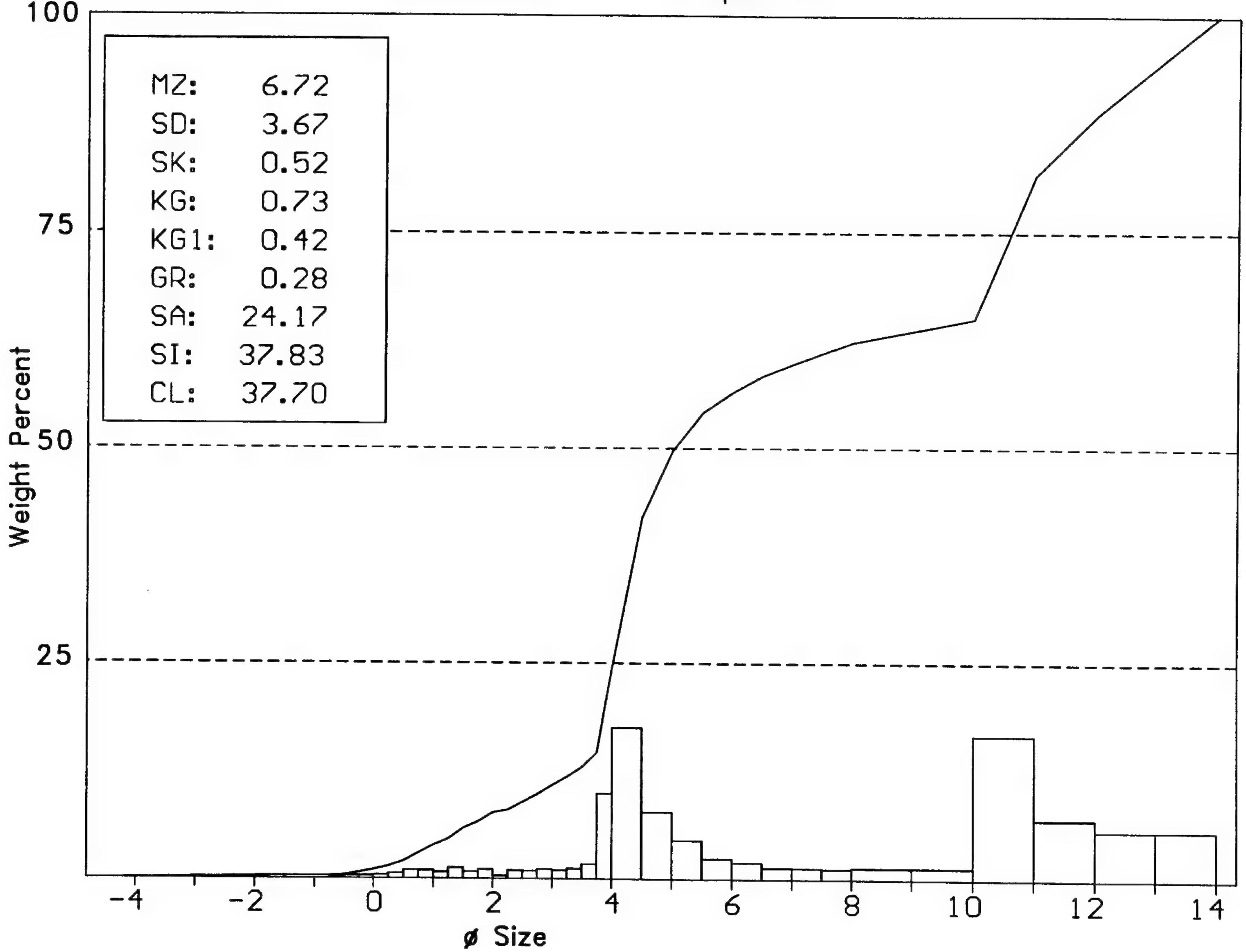
Cruise: KW-PL
Station: 198-1
Sample: 28-30
MZ: 6.10
SD: 3.92
SK: 0.50
KG: 0.77
KG1: 0.44
GR: 2.33
SA: 36.23
SI: 33.51
CL: 27.92
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

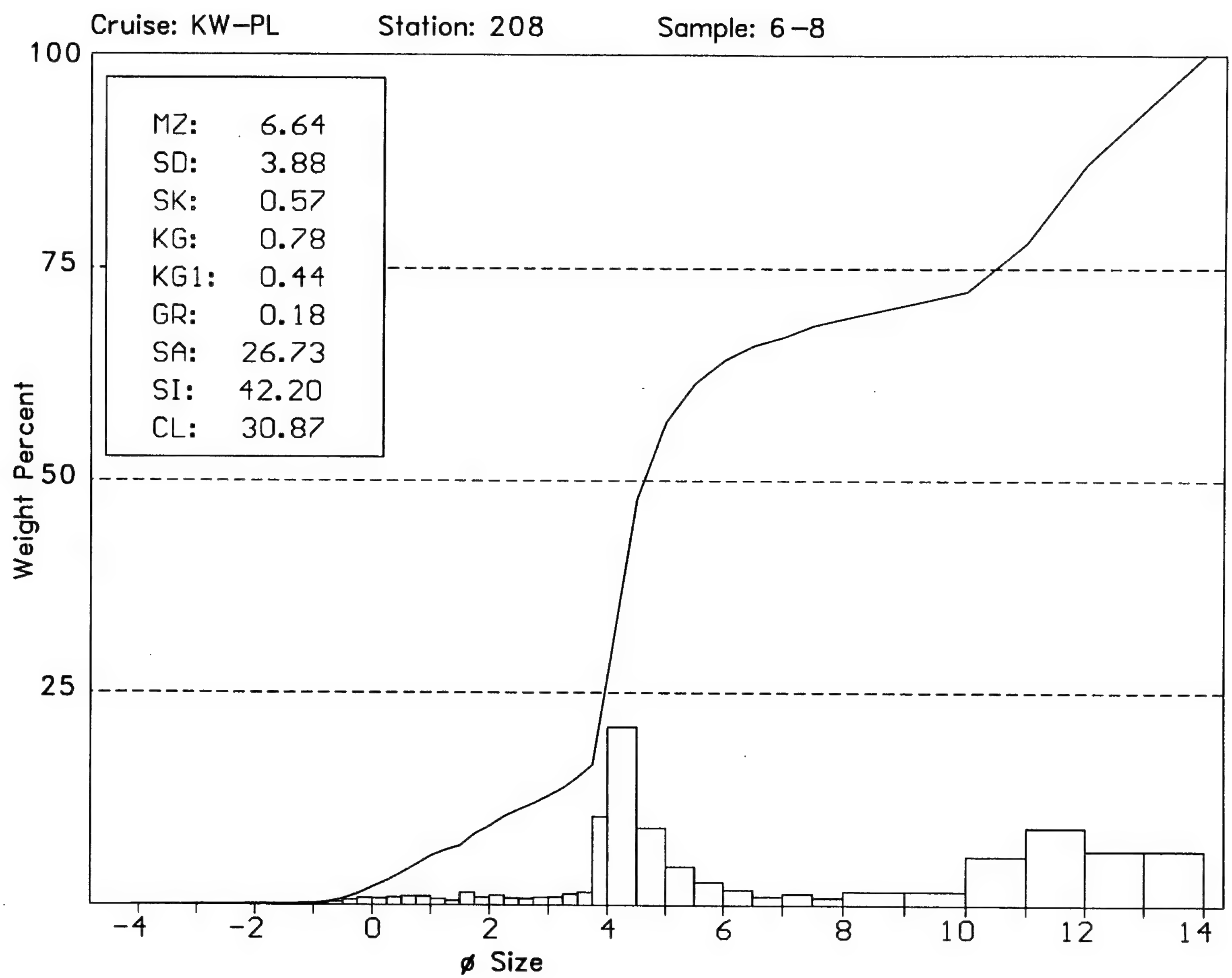

Cruise: KW-PL
Station: 198-1
Sample: 30-32
MZ: 6.78
SD: 3.72
SK: 0.39
KG: 0.71
KG1: 0.41
GR: 0.70
SA: 27.08
SI: 33.37
CL: 38.86
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size


Cruise: KW-PL
Station: 208
Sample: 0-2
MZ: 6.61
SD: 3.80
SK: 0.50
KG: 0.74
KG1: 0.42
GR: 0.00
SA: 25.94
SI: 38.25
CL: 35.77
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

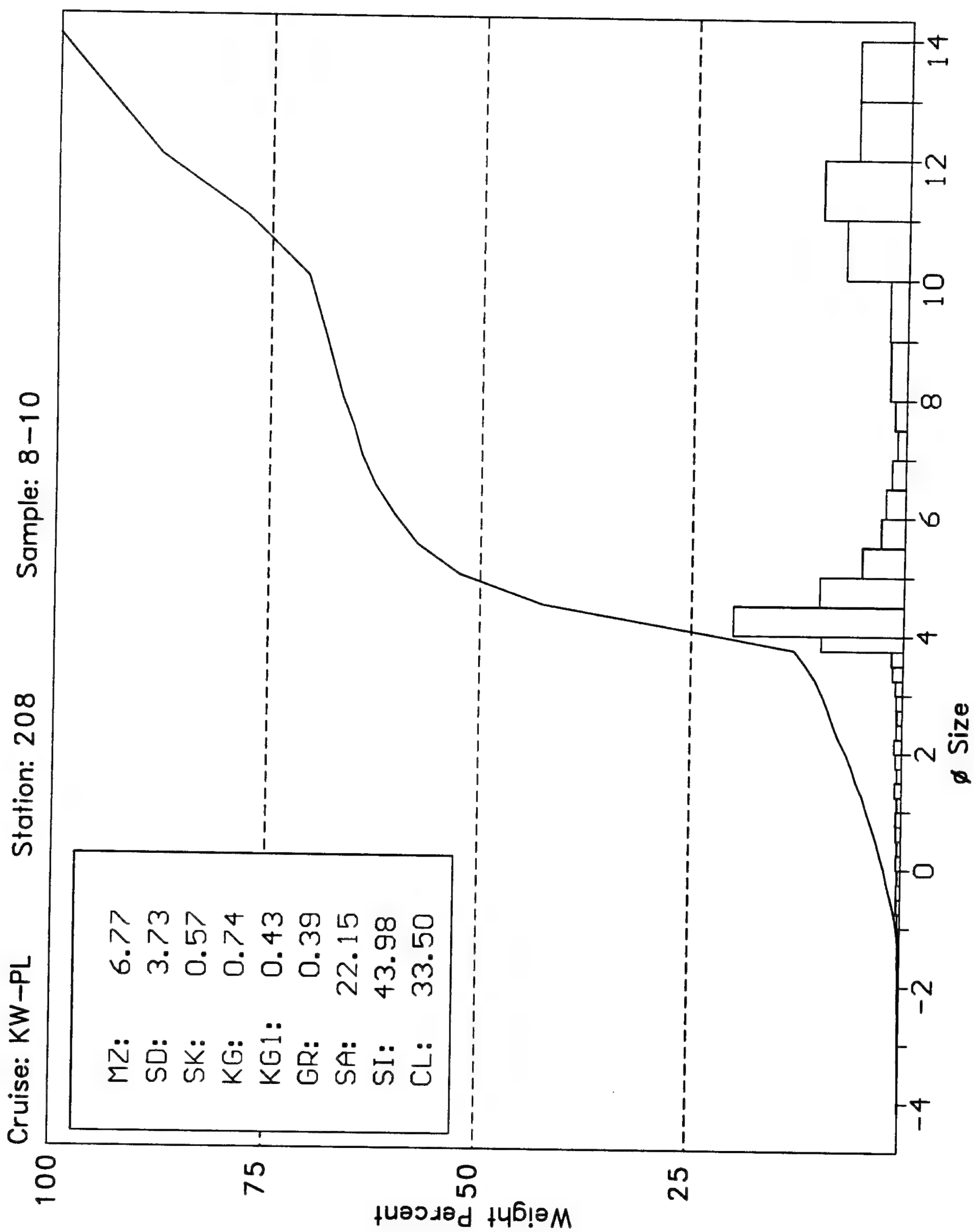

Cruise: KW-PL
Station: 208
Sample: 2-4
100
75
50
25
Weight Percent
MZ: 6.38
SD: 3.86
SK: 0.56
KG: 0.77
KG1: 0.43
GR: 0.21
SA: 31.46
SI: 39.14
CL: 29.21
-4
-2
0
2
4
6
8
10
12
14
ø Size

Cruise: KW-PL Station: 208 Sample: 4-6

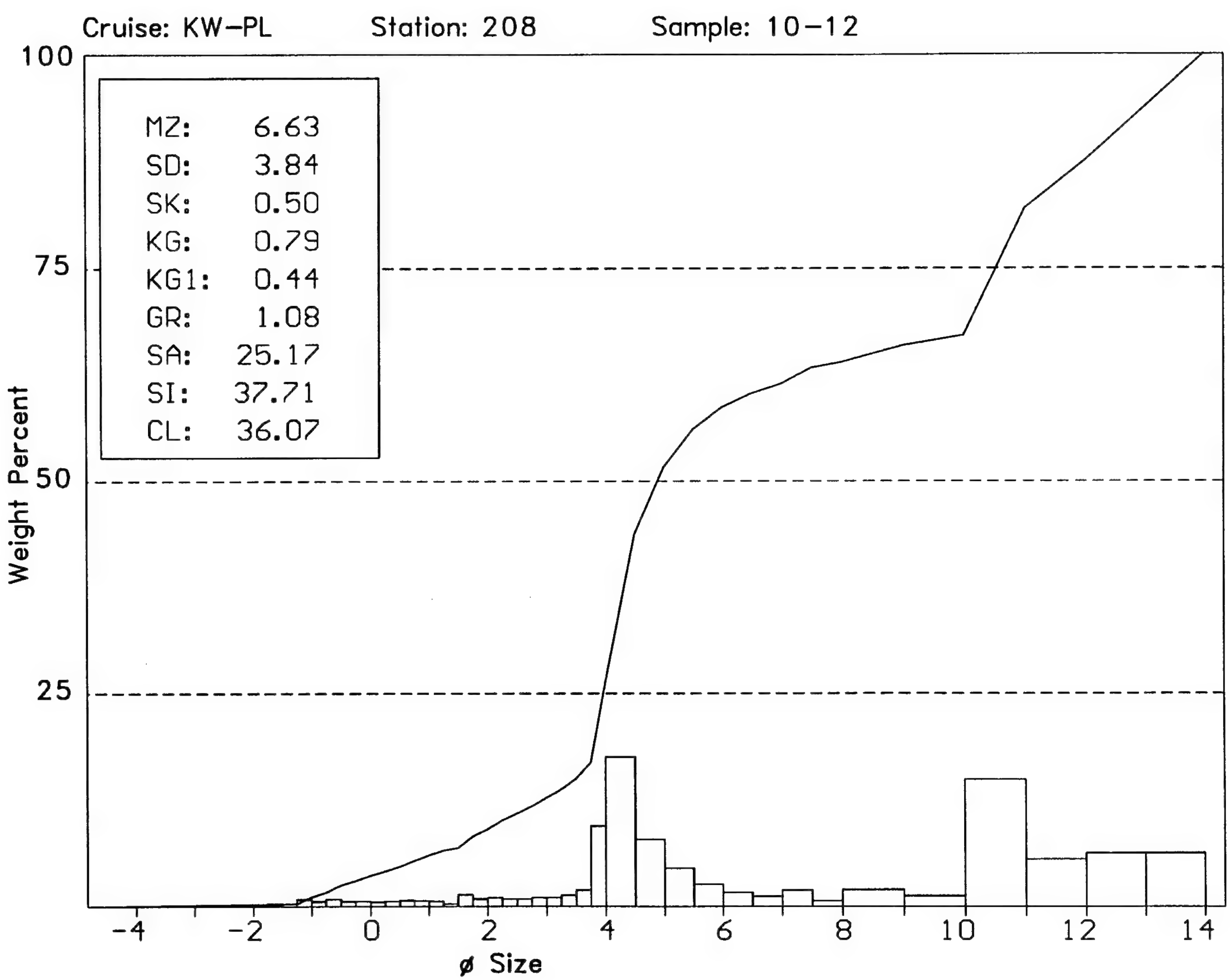


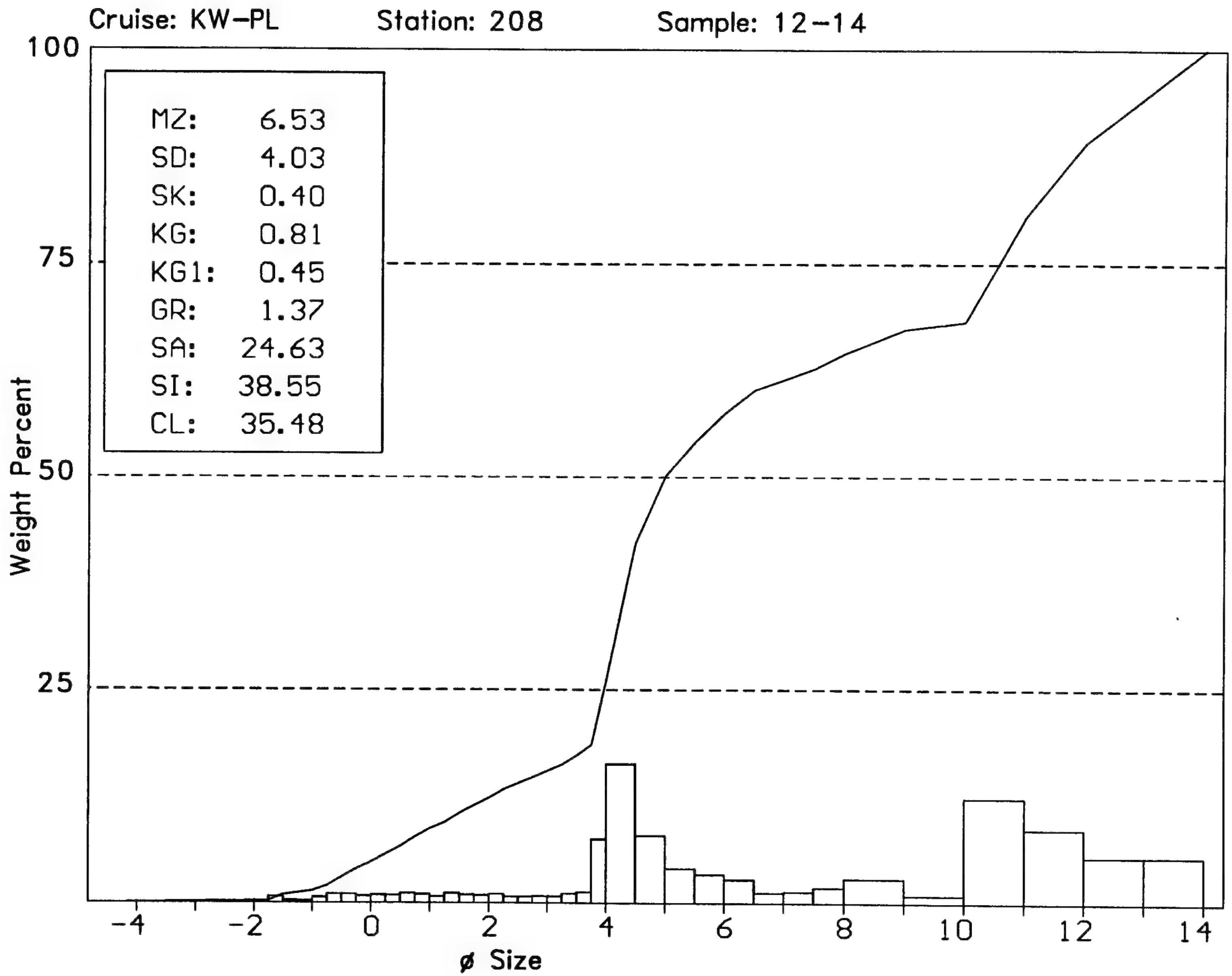


Cruise: KW-PL
Station: 208
Sample: 6-8
MZ: 6.64
SD: 3.88
SK: 0.57
KG: 0.78
KG1: 0.44
GR: 0.18
SA: 26.73
SI: 42.20
CL: 30.87
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

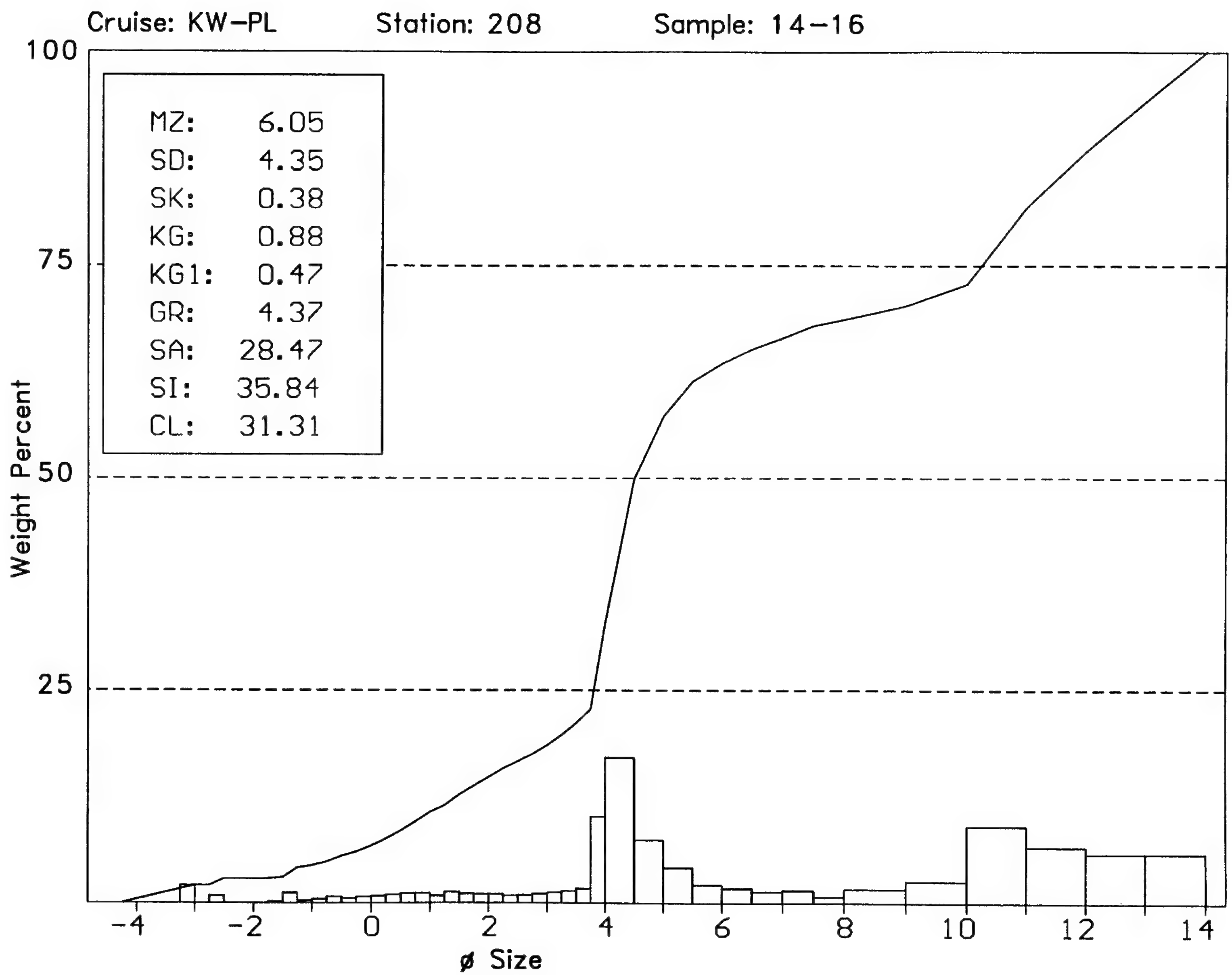


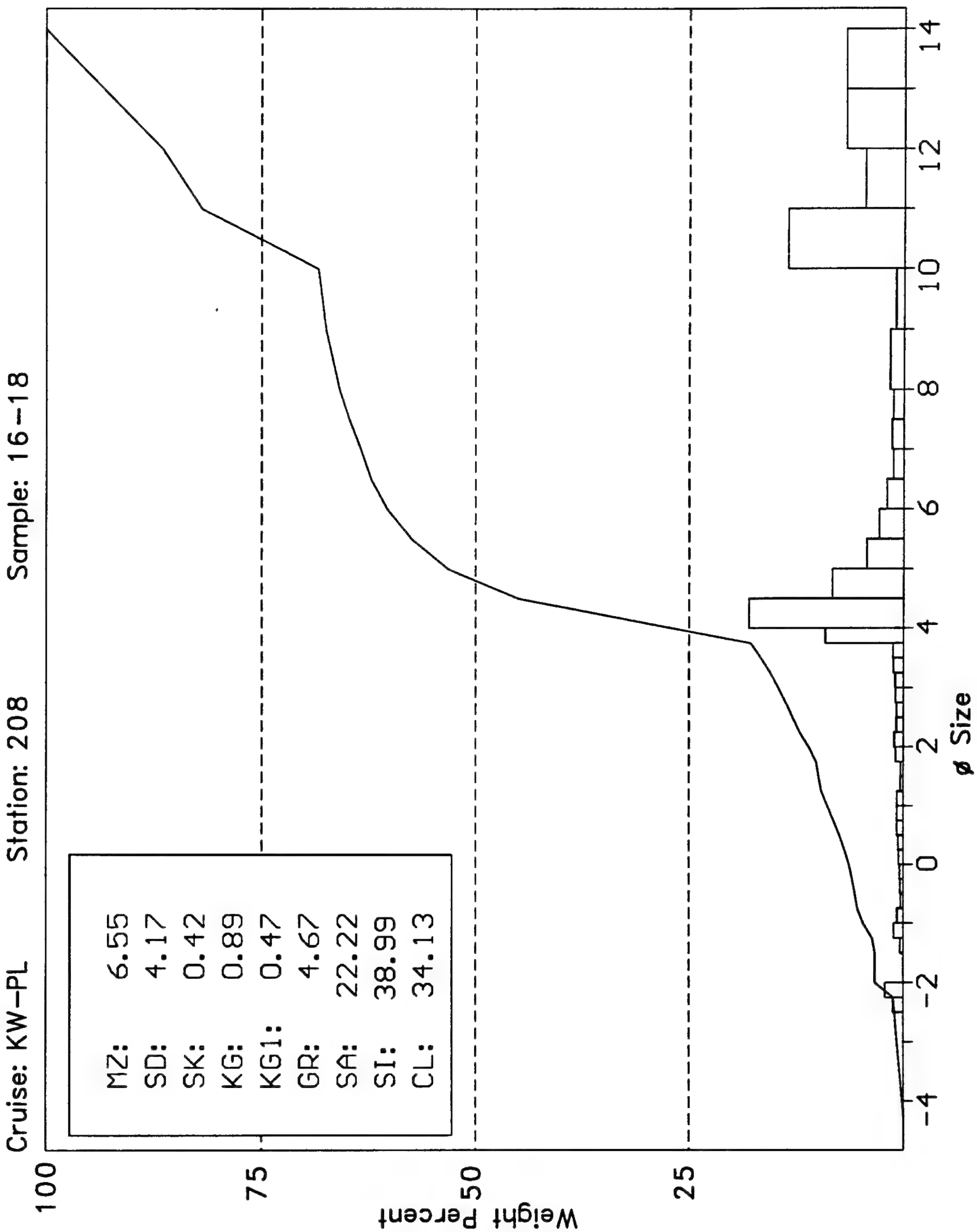
Cruise: KW-PL
Station: 208
Sample: 8-10
MZ: 6.77
SD: 3.73
SK: 0.57
KG: 0.74
KG1: 0.43
GR: 0.39
SA: 22.15
SI: 43.98
CL: 33.50
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size


Cruise: KW–PL
Station: 208
Sample: 10–12
MZ: 6.63
SD: 3.84
SK: 0.50
KG: 0.79
KG1: 0.44
GR: 1.08
SA: 25.17
SI: 37.71
CL: 36.07
100
75
50
25
Weight Percent
–4
–2
0
2
4
6
8
10
12
14
ø Size

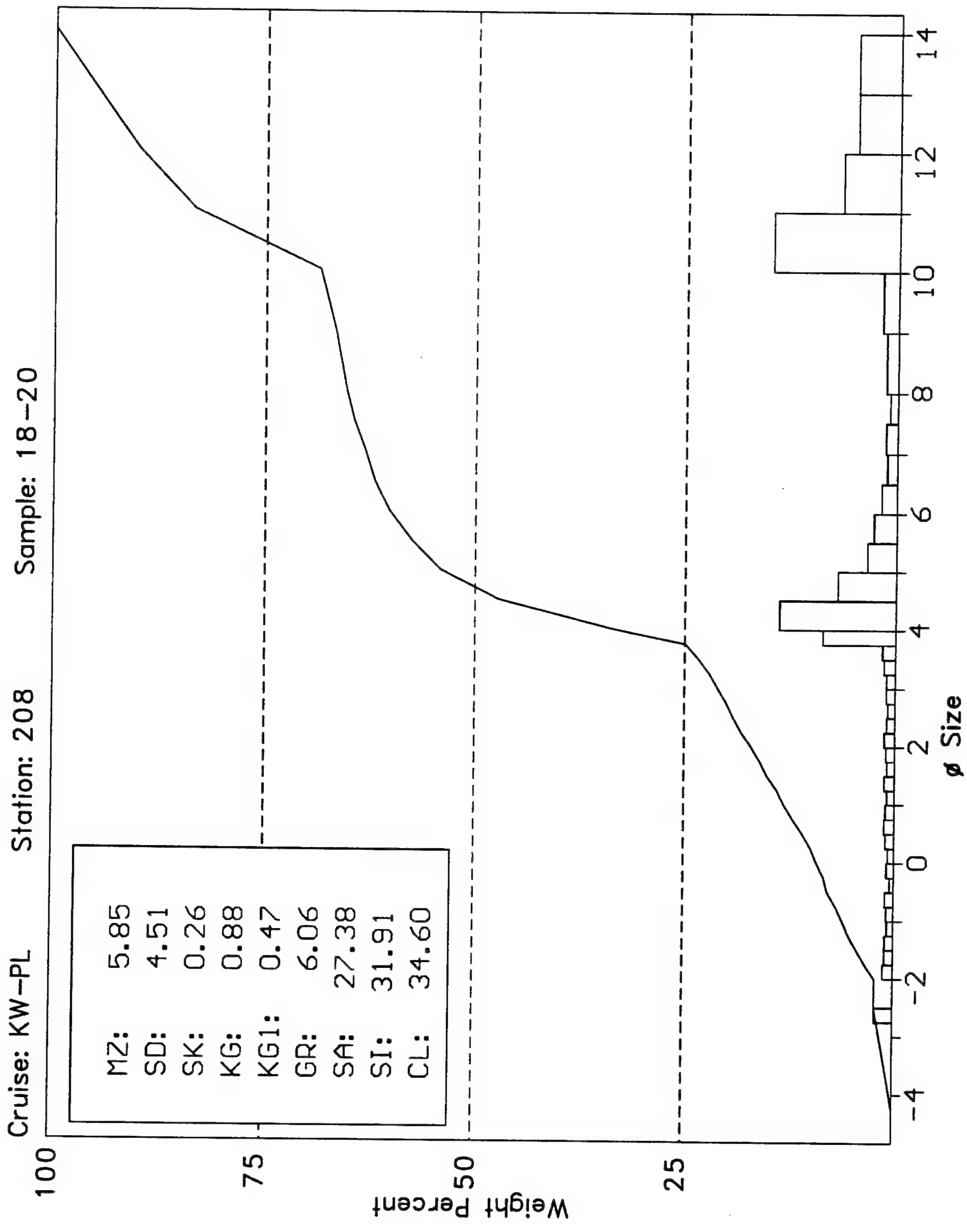


Cruise: KW-PL
Station: 208
Sample: 12-14
MZ: 6.53
SD: 4.03
SK: 0.40
KG: 0.81
KG1: 0.45
GR: 1.37
SA: 24.63
SI: 38.55
CL: 35.48
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

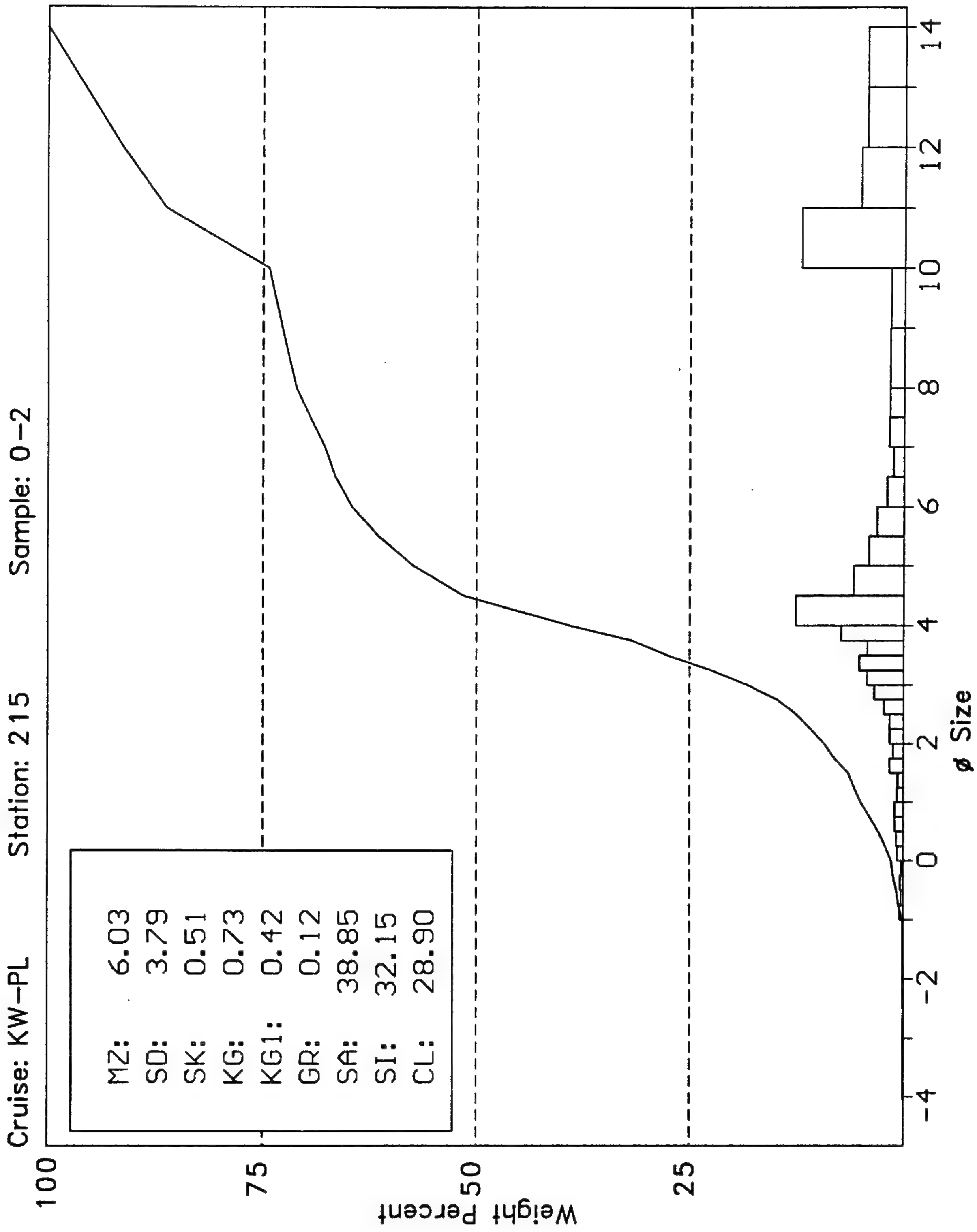

Cruise: KW-PL
Station: 208
Sample: 14-16
MZ: 6.05
SD: 4.35
SK: 0.38
KG: 0.88
KG1: 0.47
GR: 4.37
SA: 28.47
SI: 35.84
CL: 31.31
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

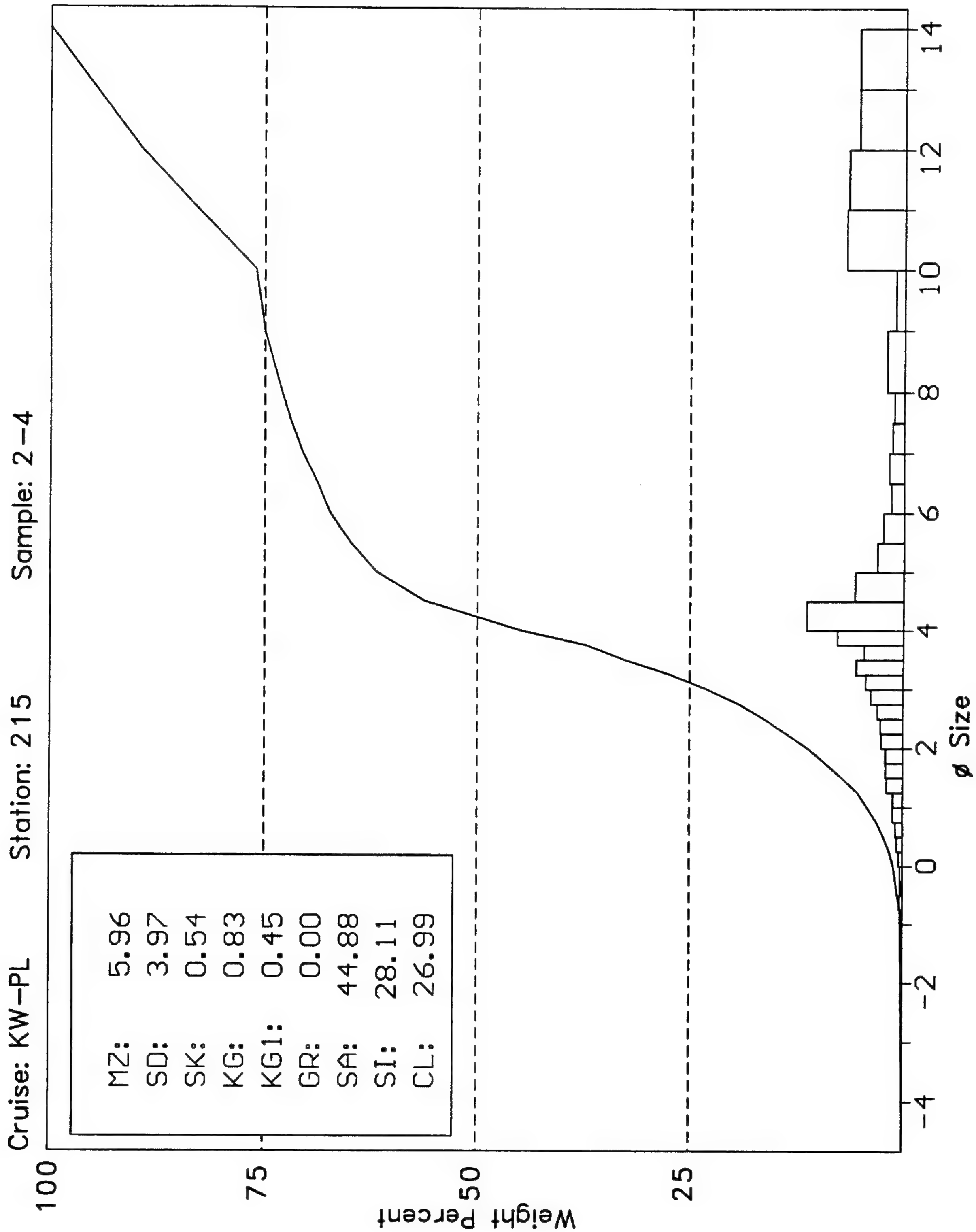


Cruise: KW-PL
Station: 208
Sample: 16-18
MZ: 6.55
SD: 4.17
SK: 0.42
KG: 0.89
KG1: 0.47
GR: 4.67
SA: 22.22
SI: 38.99
CL: 34.13
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

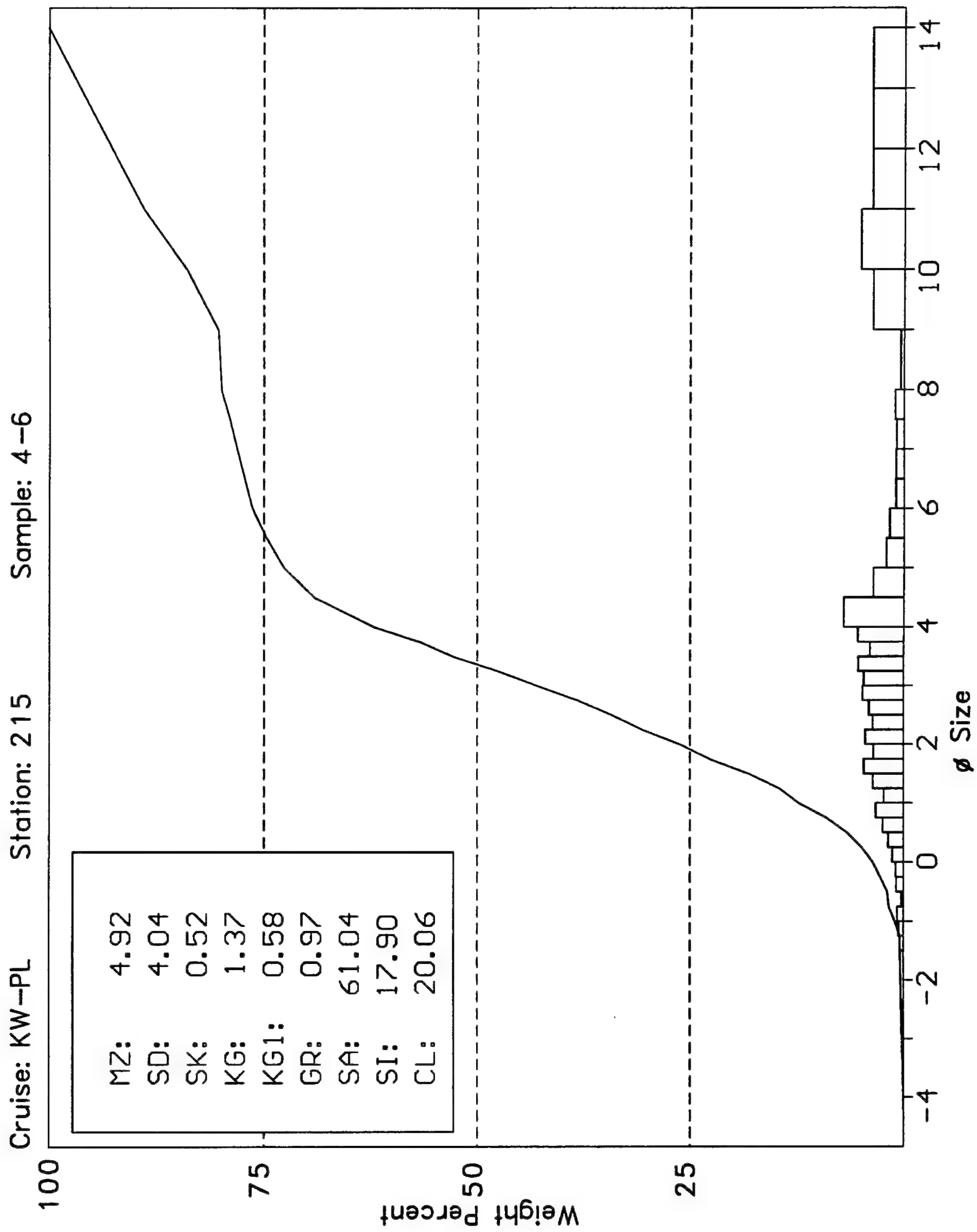


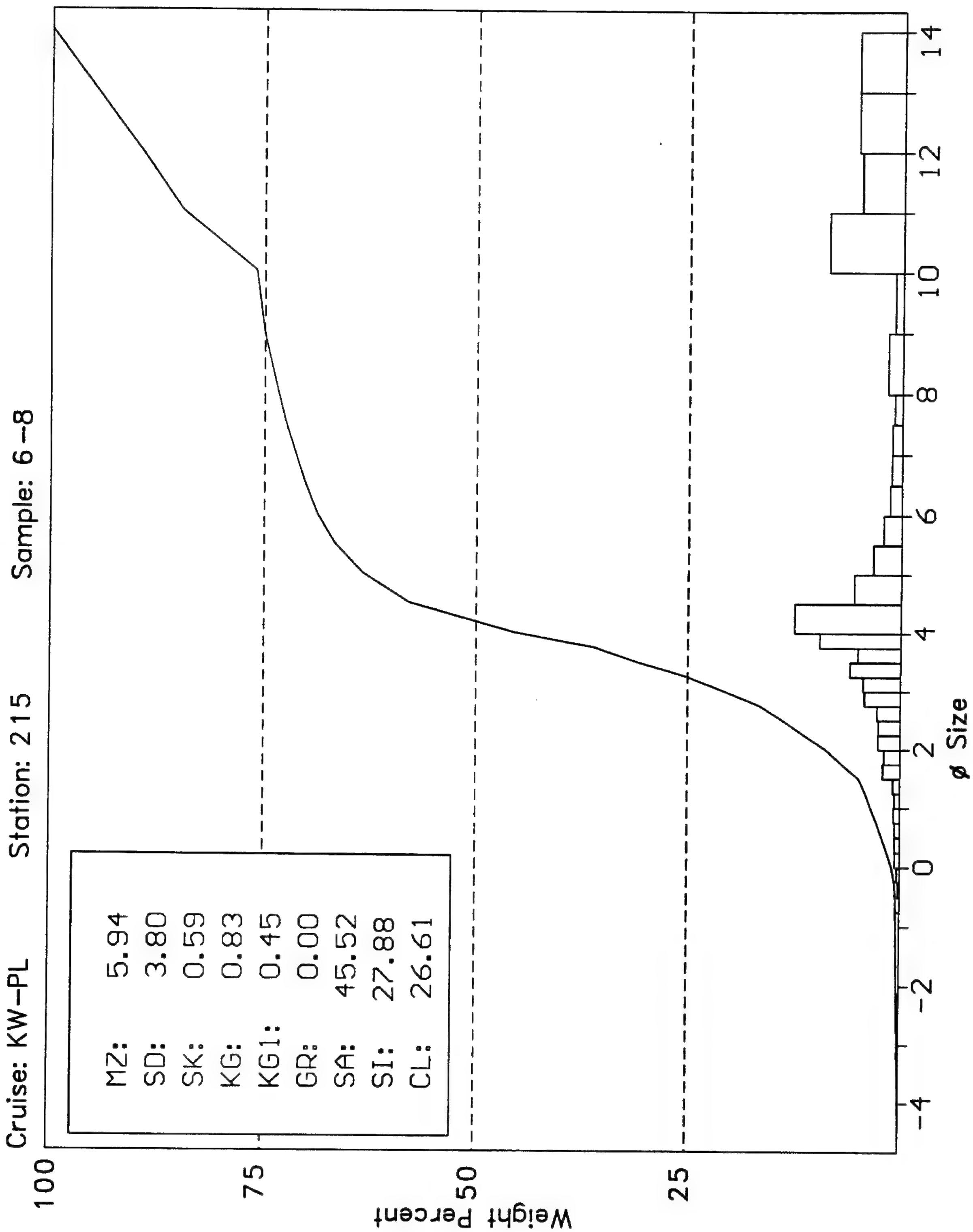
Cruise: KW-PL
Station: 208
Sample: 18-20
MZ: 5.85
SD: 4.51
SK: 0.26
KG: 0.88
KG1: 0.47
GR: 6.06
SA: 27.38
SI: 31.91
CL: 34.60
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size


Cruise: KW–PL
Station: 215
Sample: 0–2
MZ: 6.03
SD: 3.79
SK: 0.51
KG: 0.73
KG1: 0.42
GR: 0.12
SA: 38.85
SI: 32.15
CL: 28.90
Weight Percent
100
75
50
25
ø Size
−4
−2
0
2
4
6
8
10
12
14

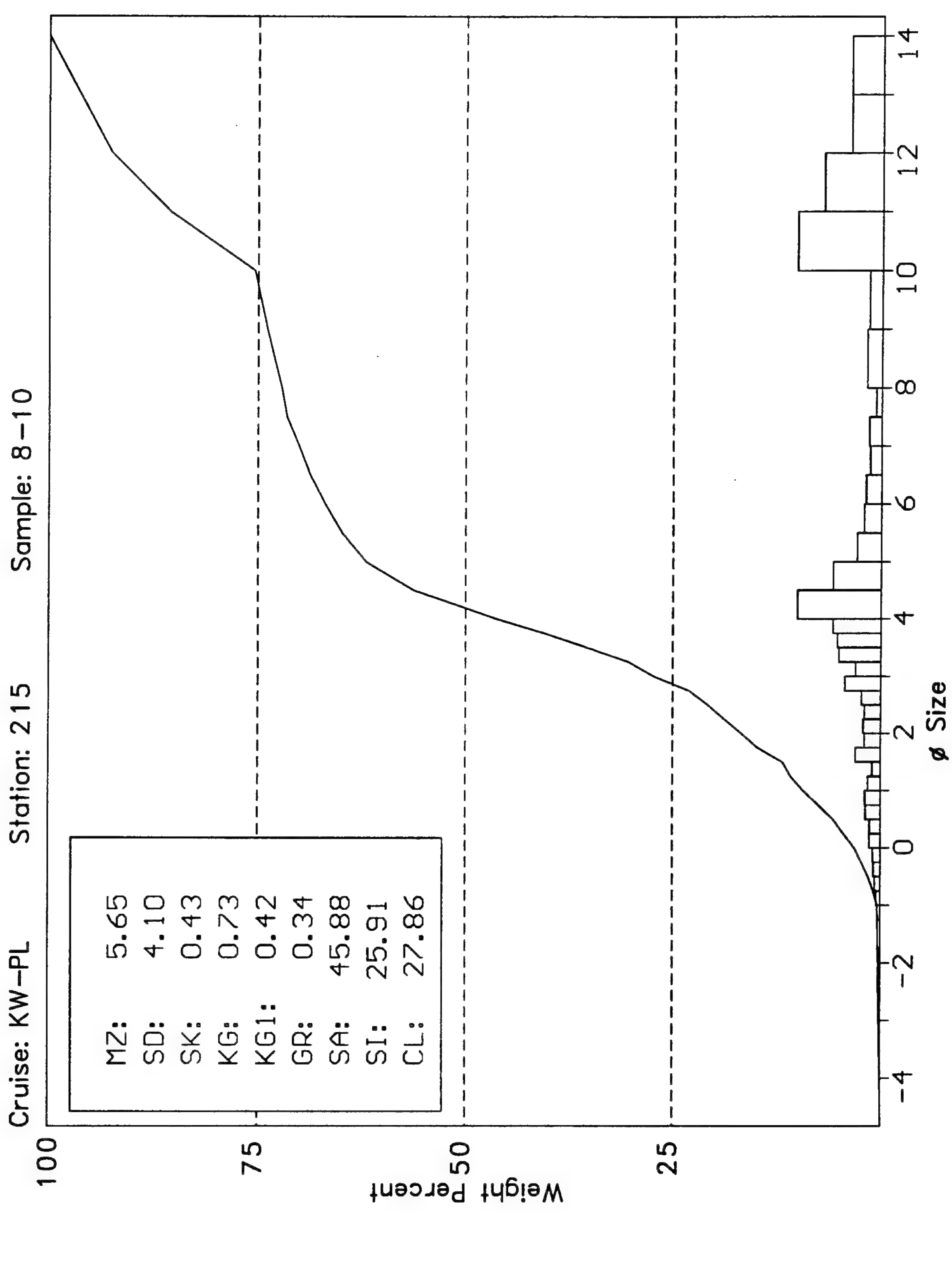


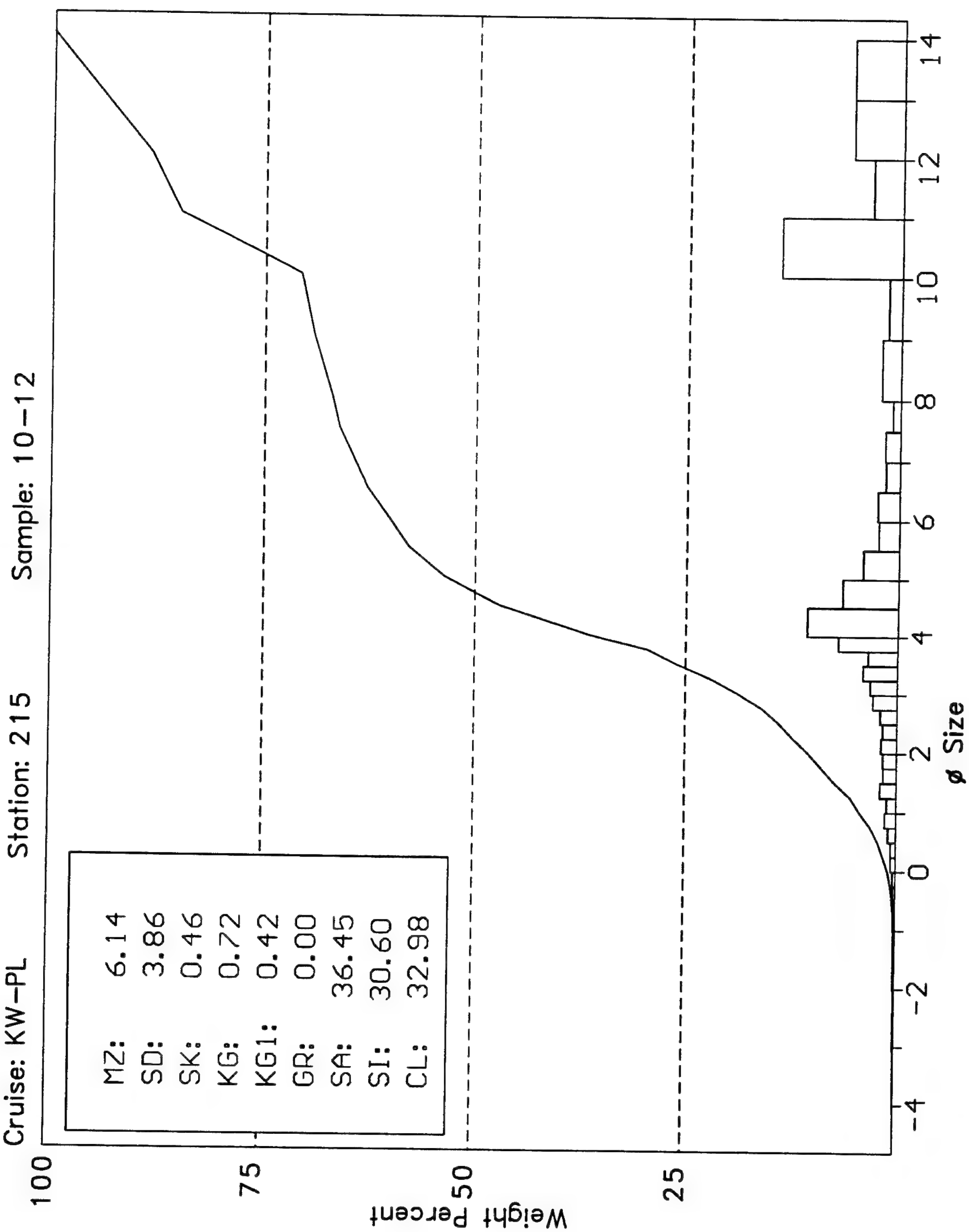
Cruise: KW-PL
Station: 215
Sample: 2-4
MZ: 5.96
SD: 3.97
SK: 0.54
KG: 0.83
KG1: 0.45
GR: 0.00
SA: 44.88
SI: 28.11
CL: 26.99
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size


Cruise: KW–PL
Station: 215
Sample: 4–6
MZ: 4.92
SD: 4.04
SK: 0.52
KG: 1.37
KG1: 0.58
GR: 0.97
SA: 61.04
SI: 17.90
CL: 20.06
100
75
50
25
Weight Percent
−4
−2
0
2
4
6
8
10
12
14
ø Size

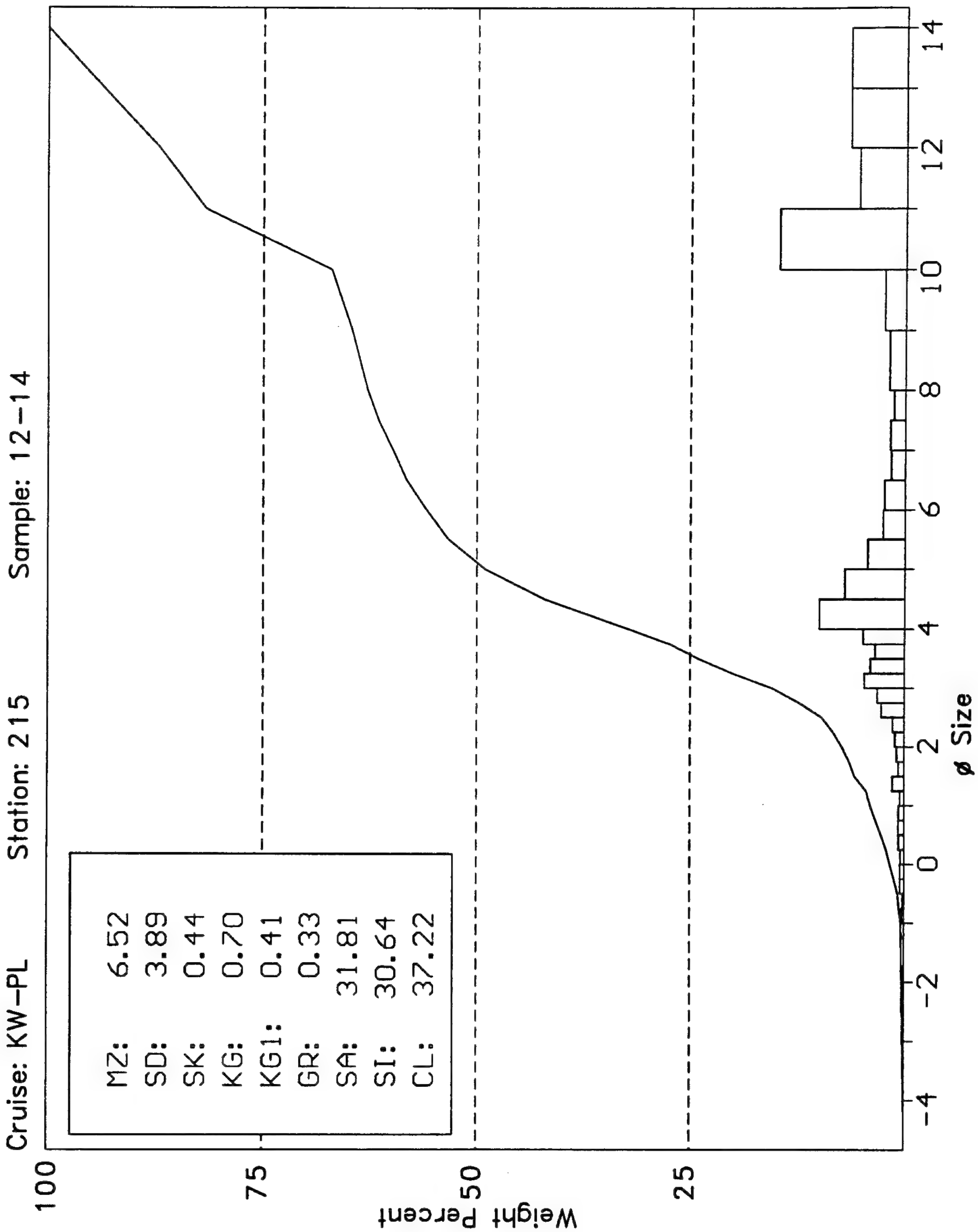


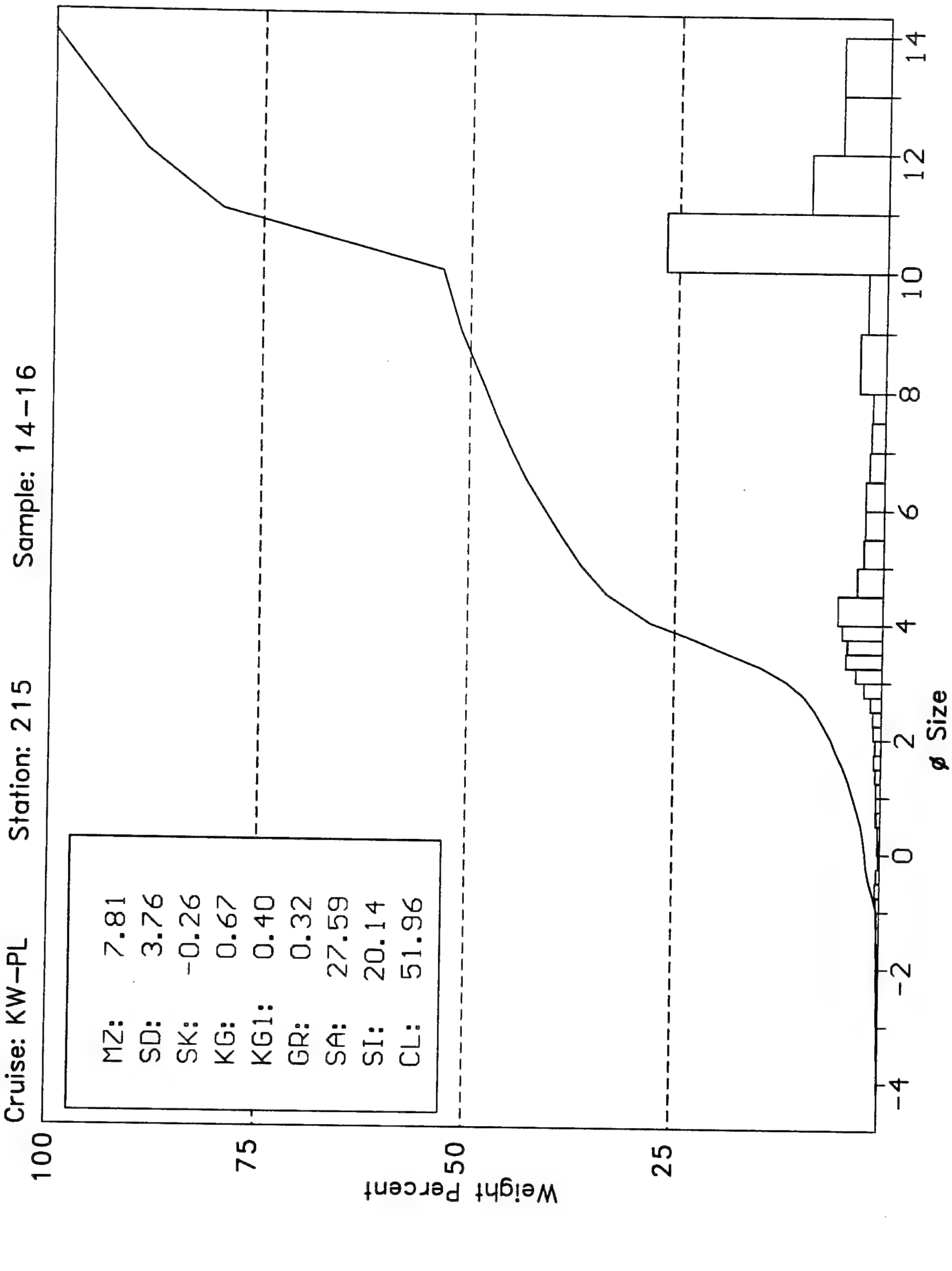
Cruise: KW-PL
Station: 215
Sample: 6-8
MZ: 5.94
SD: 3.80
SK: 0.59
KG: 0.83
KG1: 0.45
GR: 0.00
SA: 45.52
SI: 27.88
CL: 26.61
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size


Cruise: KW-PL
Station: 215
Sample: 8-10
MZ: 5.65
SD: 4.10
SK: 0.43
KG: 0.73
KG1: 0.42
GR: 0.34
SA: 45.88
SI: 25.91
CL: 27.86
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

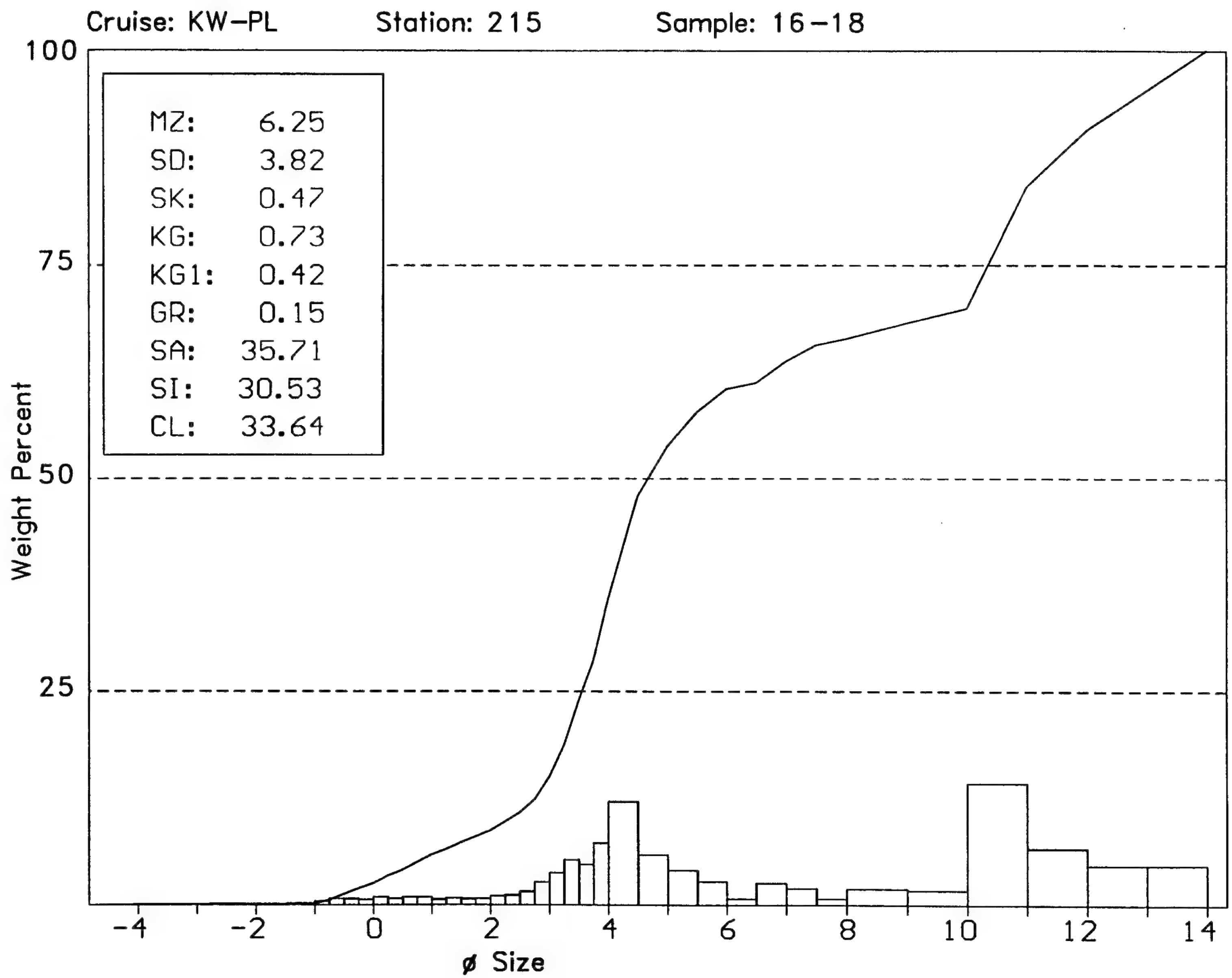


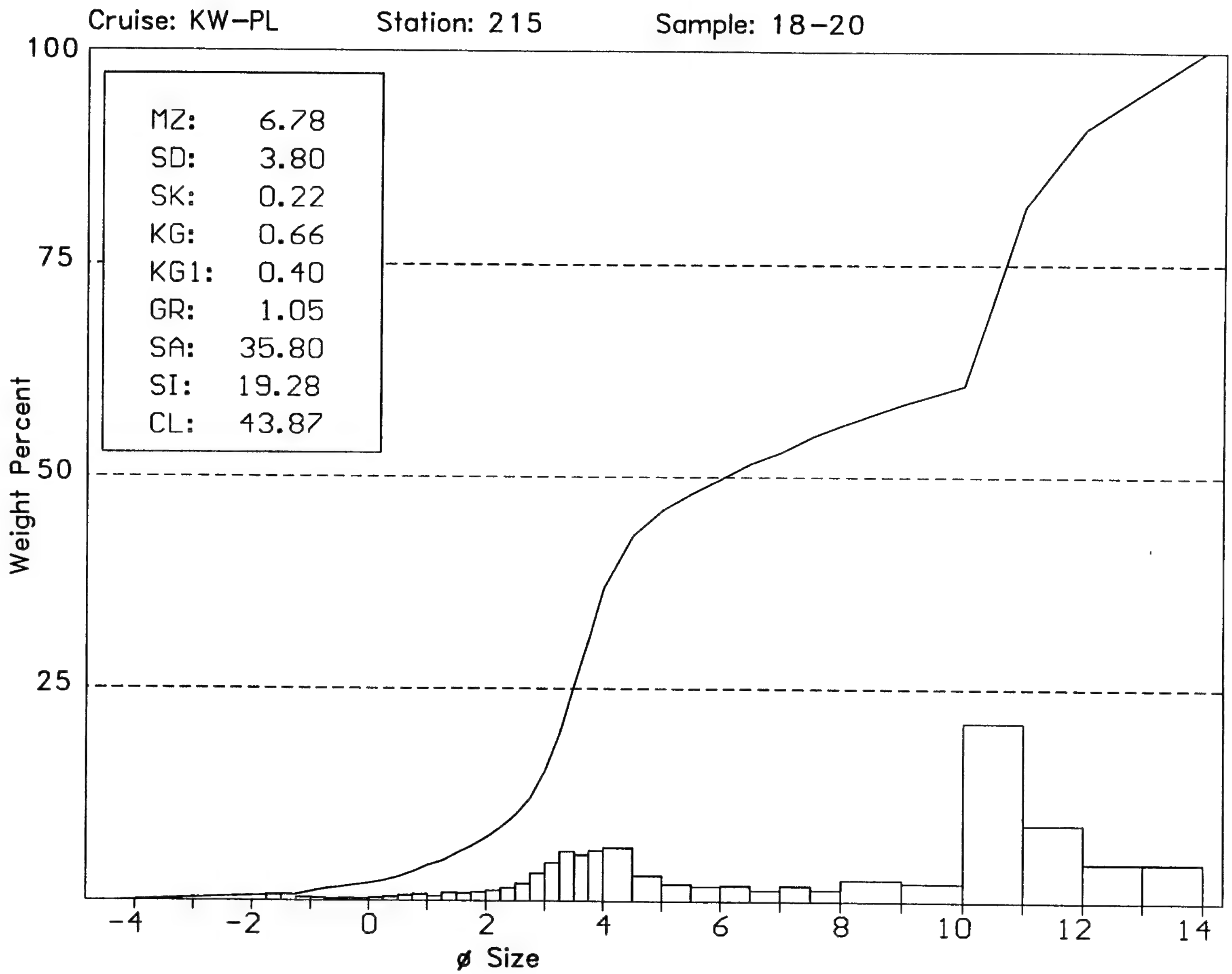
Cruise: KW-PL
Station: 215
Sample: 10-12
MZ: 6.14
SD: 3.86
SK: 0.46
KG: 0.72
KG1: 0.42
GR: 0.00
SA: 36.45
SI: 30.60
CL: 32.98
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size


Cruise: KW-PL
Station: 215
Sample: 12-14
MZ: 6.52
SD: 3.89
SK: 0.44
KG: 0.70
KG1: 0.41
GR: 0.33
SA: 31.81
SI: 30.64
CL: 37.22
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

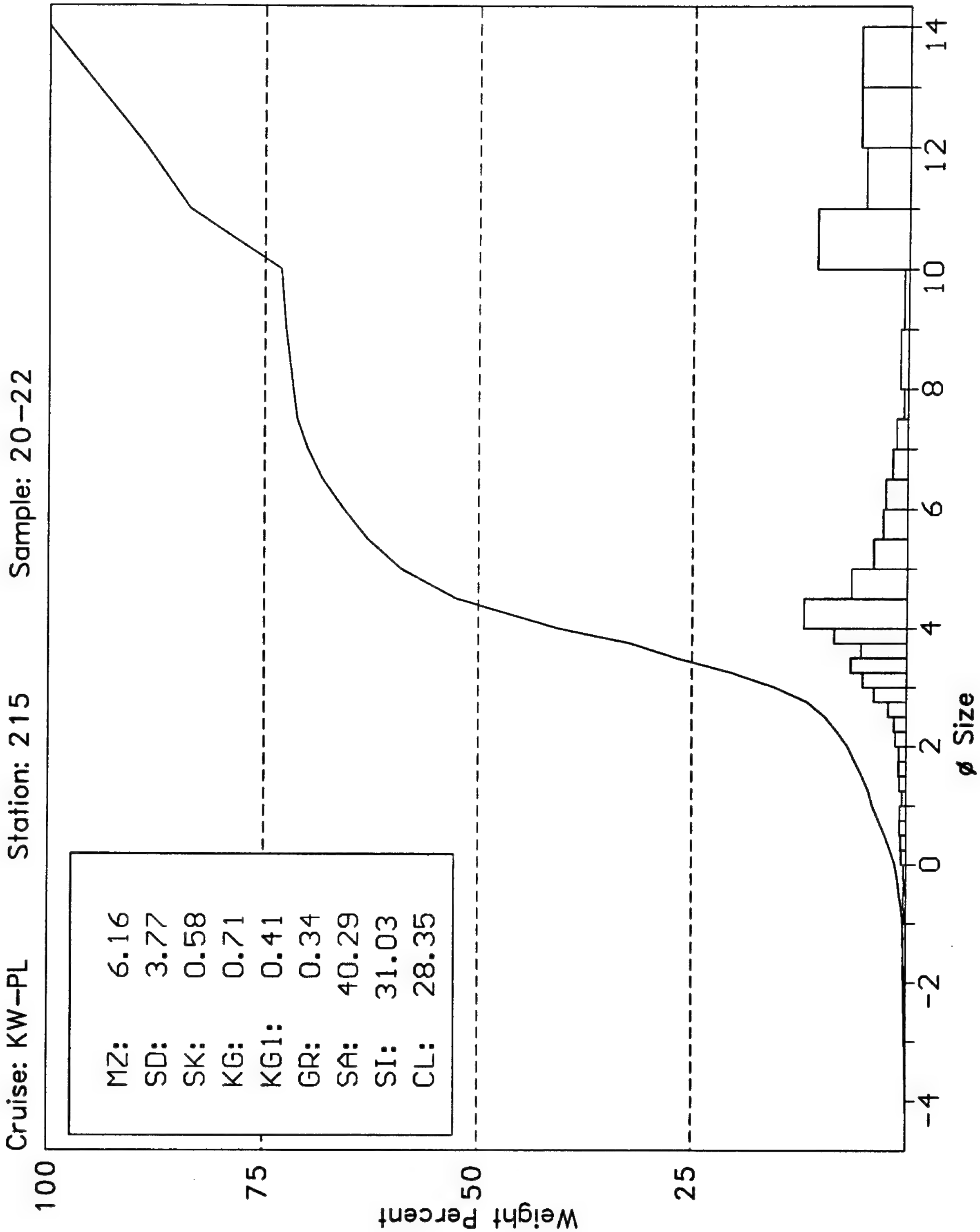


Cruise: KW-PL
Station: 215
Sample: 14-16
MZ: 7.81
SD: 3.76
SK: -0.26
KG: 0.67
KG1: 0.40
GR: 0.32
SA: 27.59
SI: 20.14
CL: 51.96
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

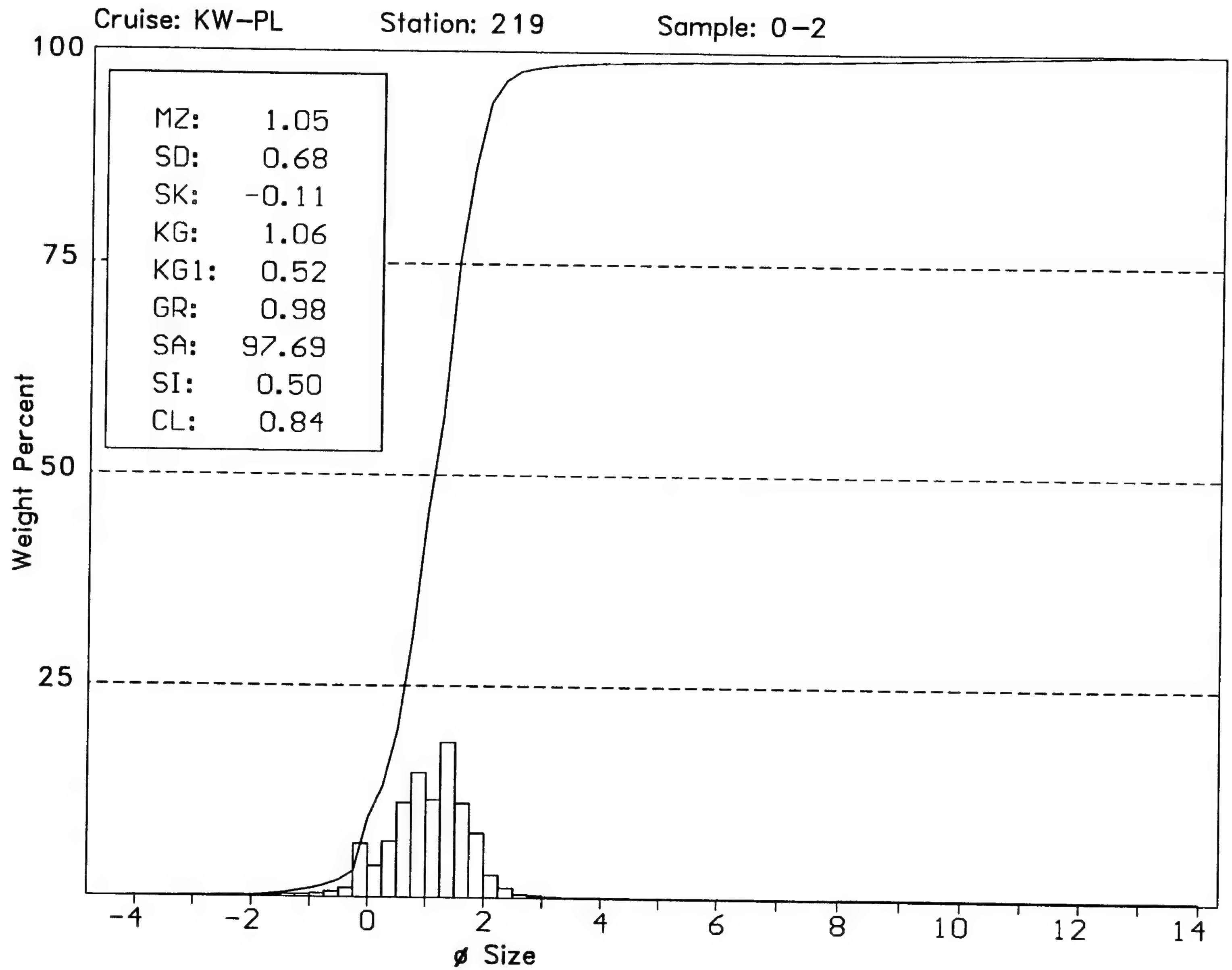

Cruise: KW-PL
Station: 215
Sample: 16-18
MZ: 6.25
SD: 3.82
SK: 0.47
KG: 0.73
KG1: 0.42
GR: 0.15
SA: 35.71
SI: 30.53
CL: 33.64
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size



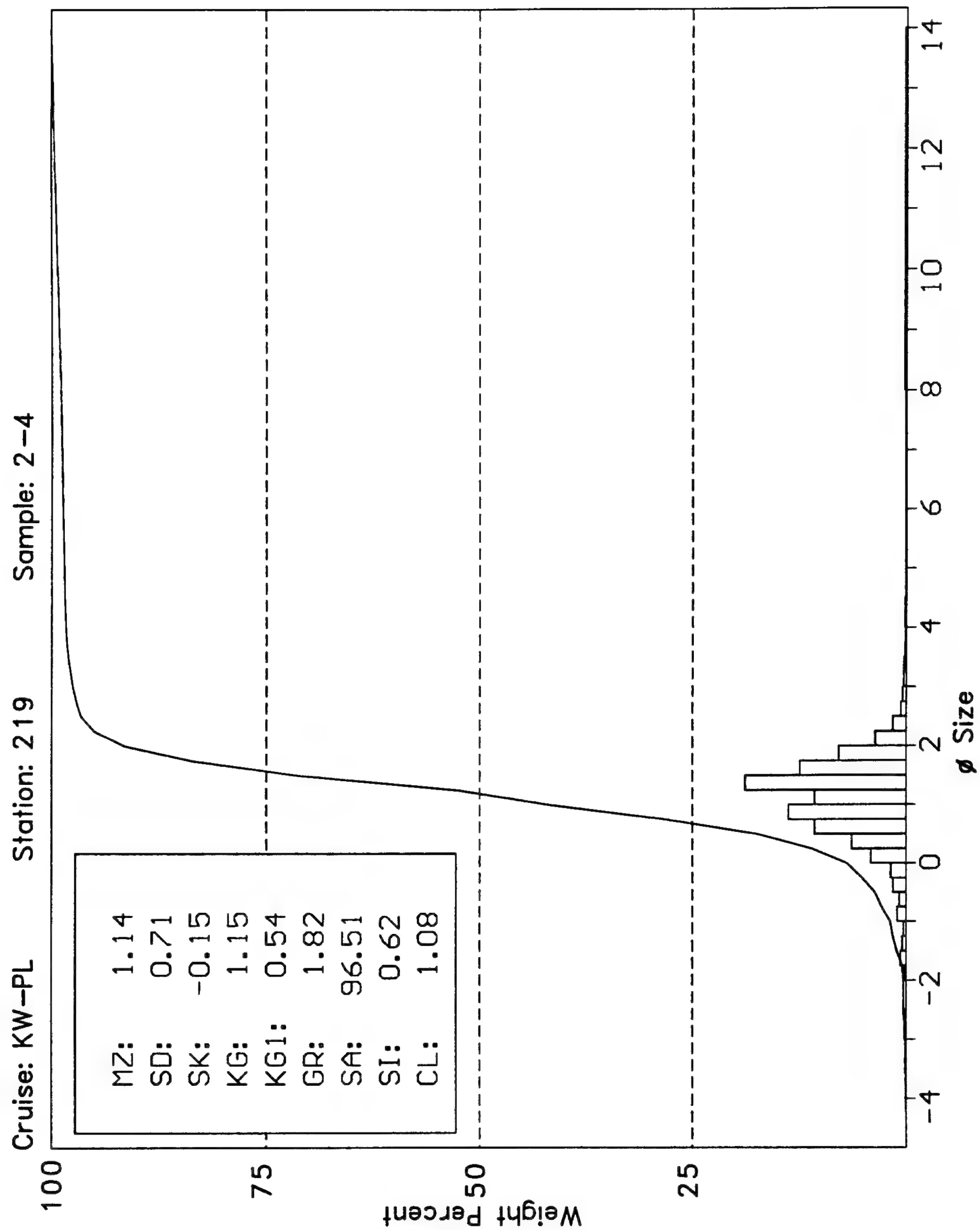
Cruise: KW-PL
Station: 215
Sample: 18-20
MZ: 6.78
SD: 3.80
SK: 0.22
KG: 0.66
KG1: 0.40
GR: 1.05
SA: 35.80
SI: 19.28
CL: 43.87
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

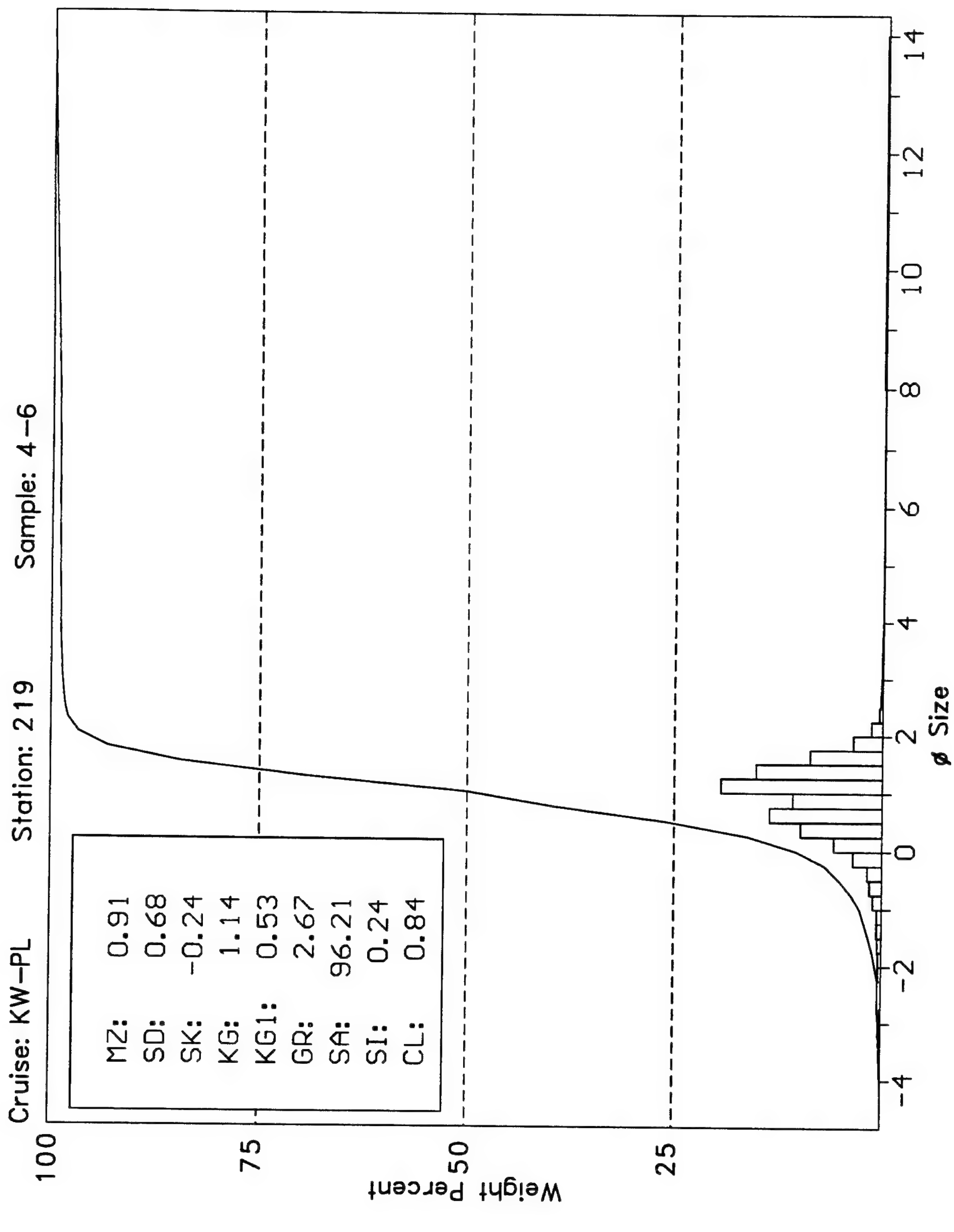


Cruise: KW-PL
Station: 215
Sample: 20-22
MZ: 6.16
SD: 3.77
SK: 0.58
KG: 0.71
KG1: 0.41
GR: 0.34
SA: 40.29
SI: 31.03
CL: 28.35
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

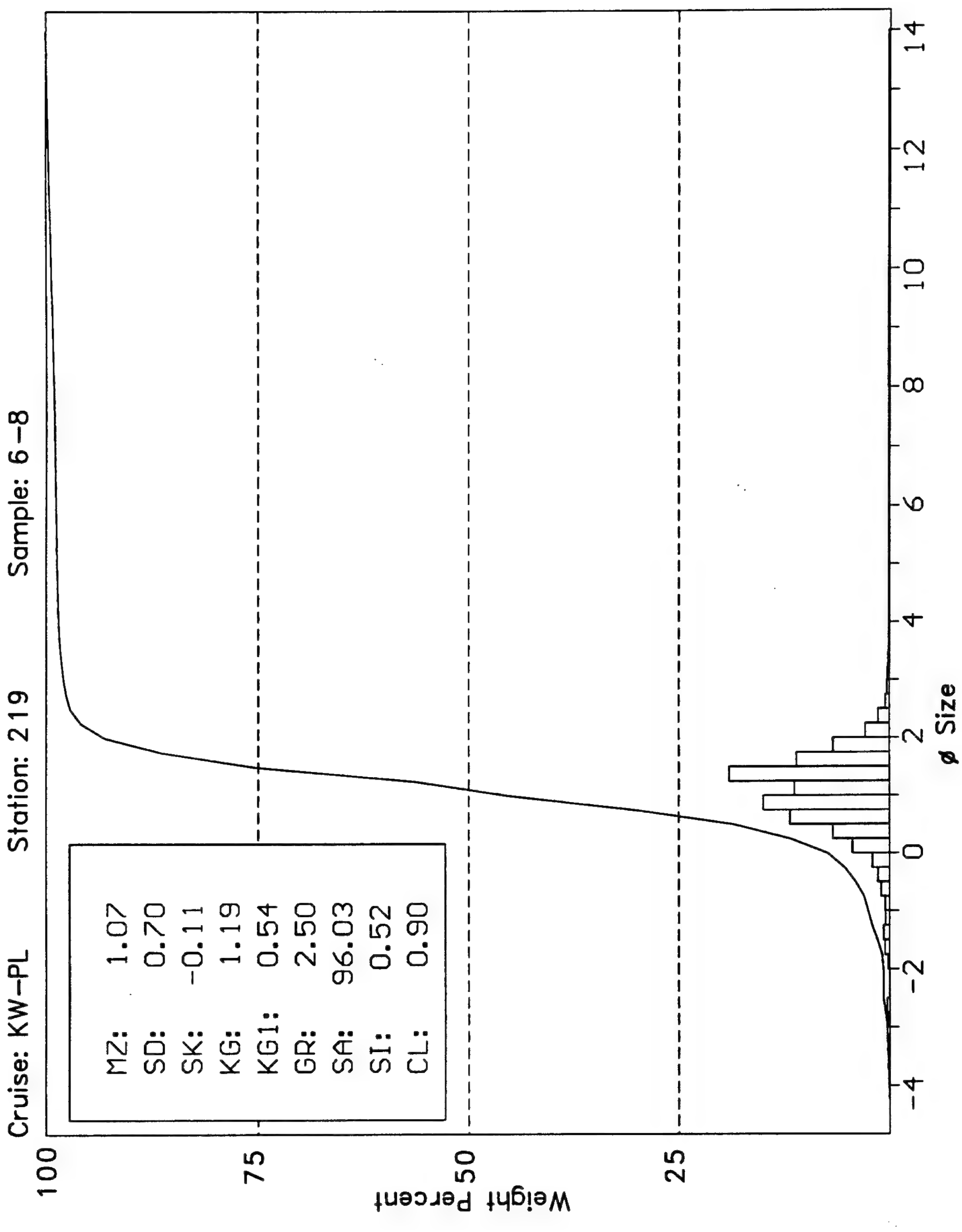


Cruise: KW-PL
Station: 219
Sample: 0-2
MZ: 1.05
SD: 0.68
SK: -0.11
KG: 1.06
KG1: 0.52
GR: 0.98
SA: 97.69
SI: 0.50
CL: 0.84
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

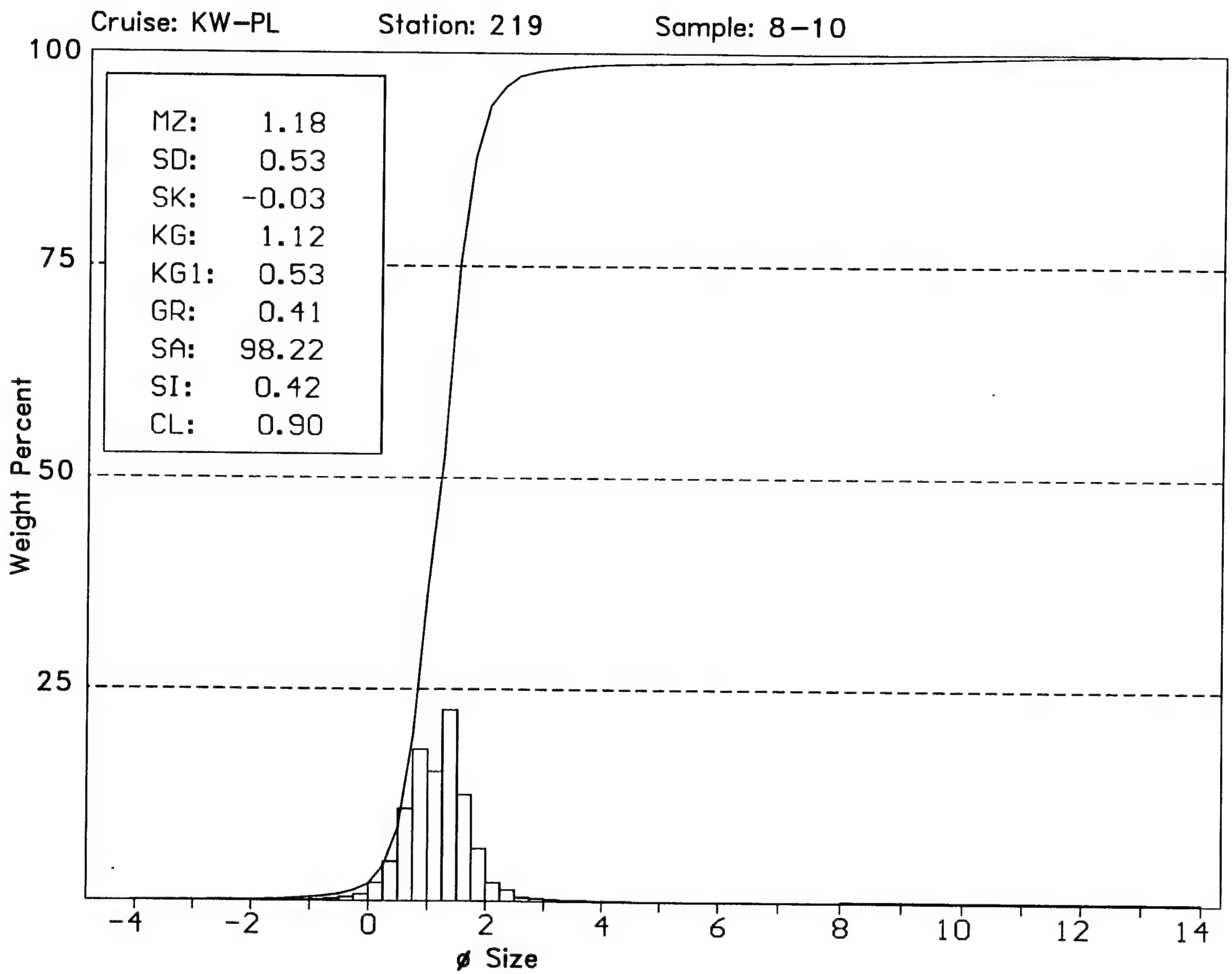

Cruise: KW-PL
Station: 219
Sample: 2-4
MZ: 1.14
SD: 0.71
SK: -0.15
KG: 1.15
KG1: 0.54
GR: 1.82
SA: 96.51
SI: 0.62
CL: 1.08
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size



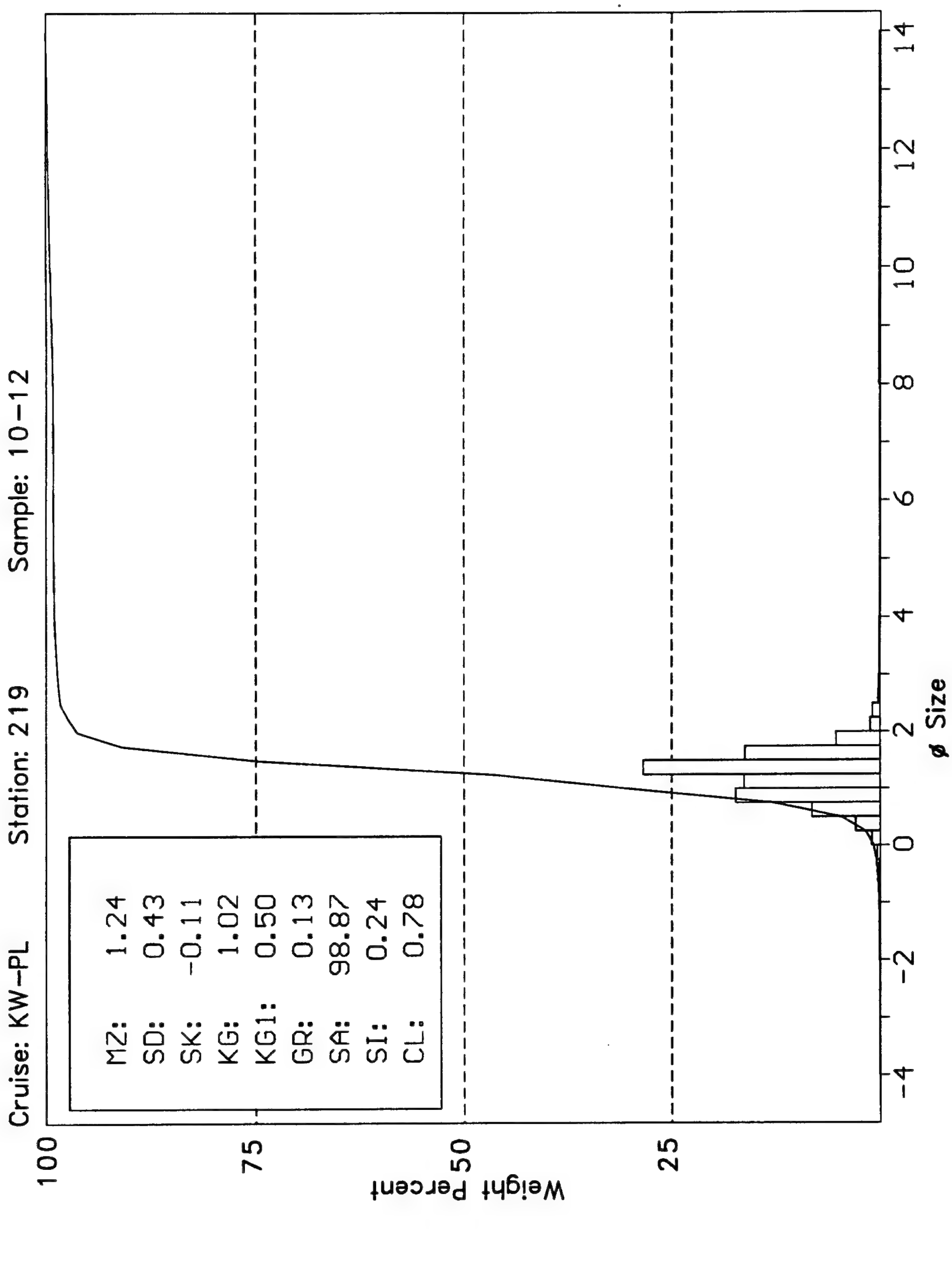
Cruise: KW–PL
Station: 219
Sample: 4–6
MZ: 0.91
SD: 0.68
SK: -0.24
KG: 1.14
KG1: 0.53
GR: 2.67
SA: 96.21
SI: 0.24
CL: 0.84
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size



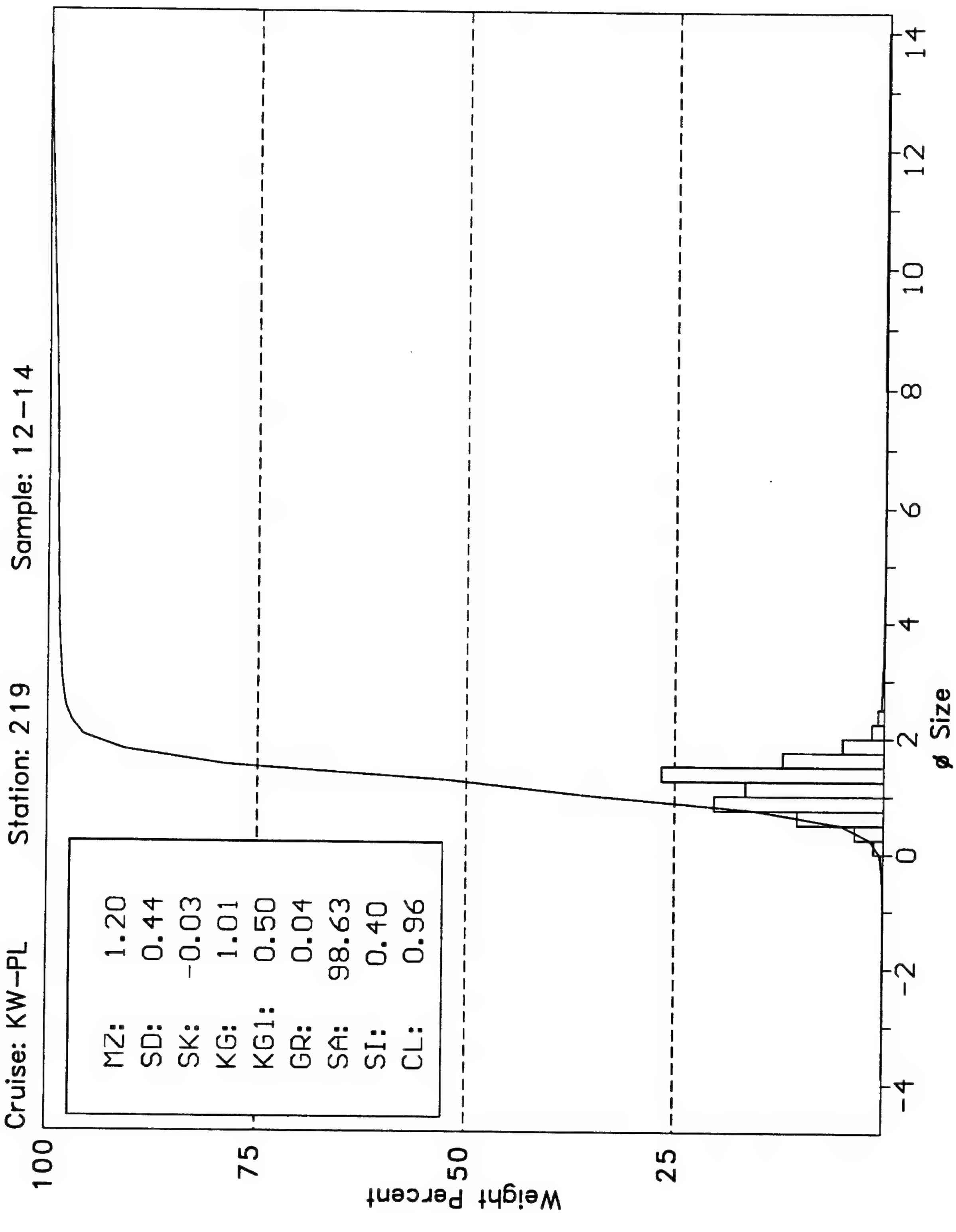
Cruise: KW–PL
Station: 219
Sample: 6–8
MZ: 1.07
SD: 0.70
SK: -0.11
KG: 1.19
KG1: 0.54
GR: 2.50
SA: 96.03
SI: 0.52
CL: 0.90
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

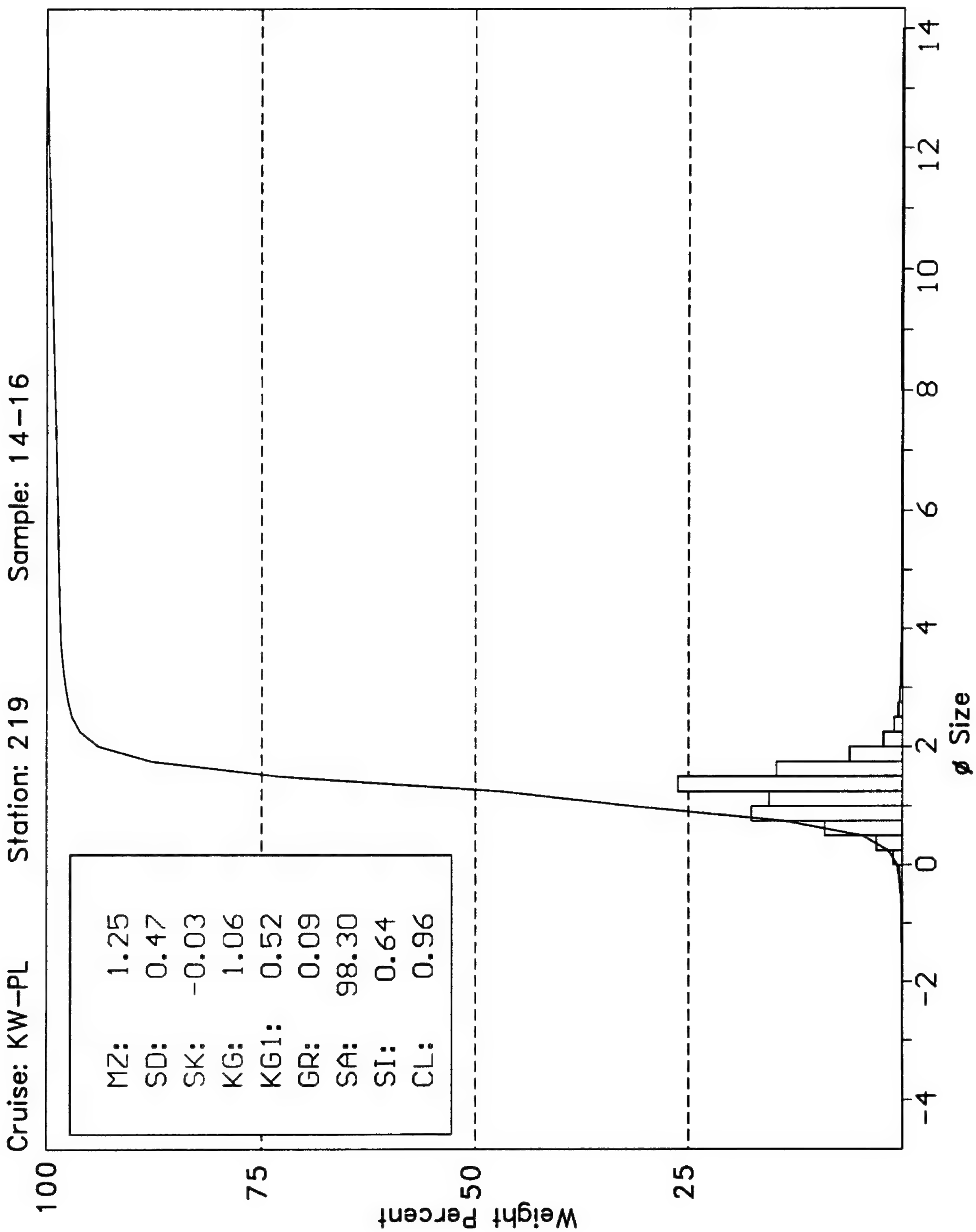


Cruise: KW-PL
Station: 219
Sample: 8-10
MZ: 1.18
SD: 0.53
SK: -0.03
KG: 1.12
KG1: 0.53
GR: 0.41
SA: 98.22
SI: 0.42
CL: 0.90
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

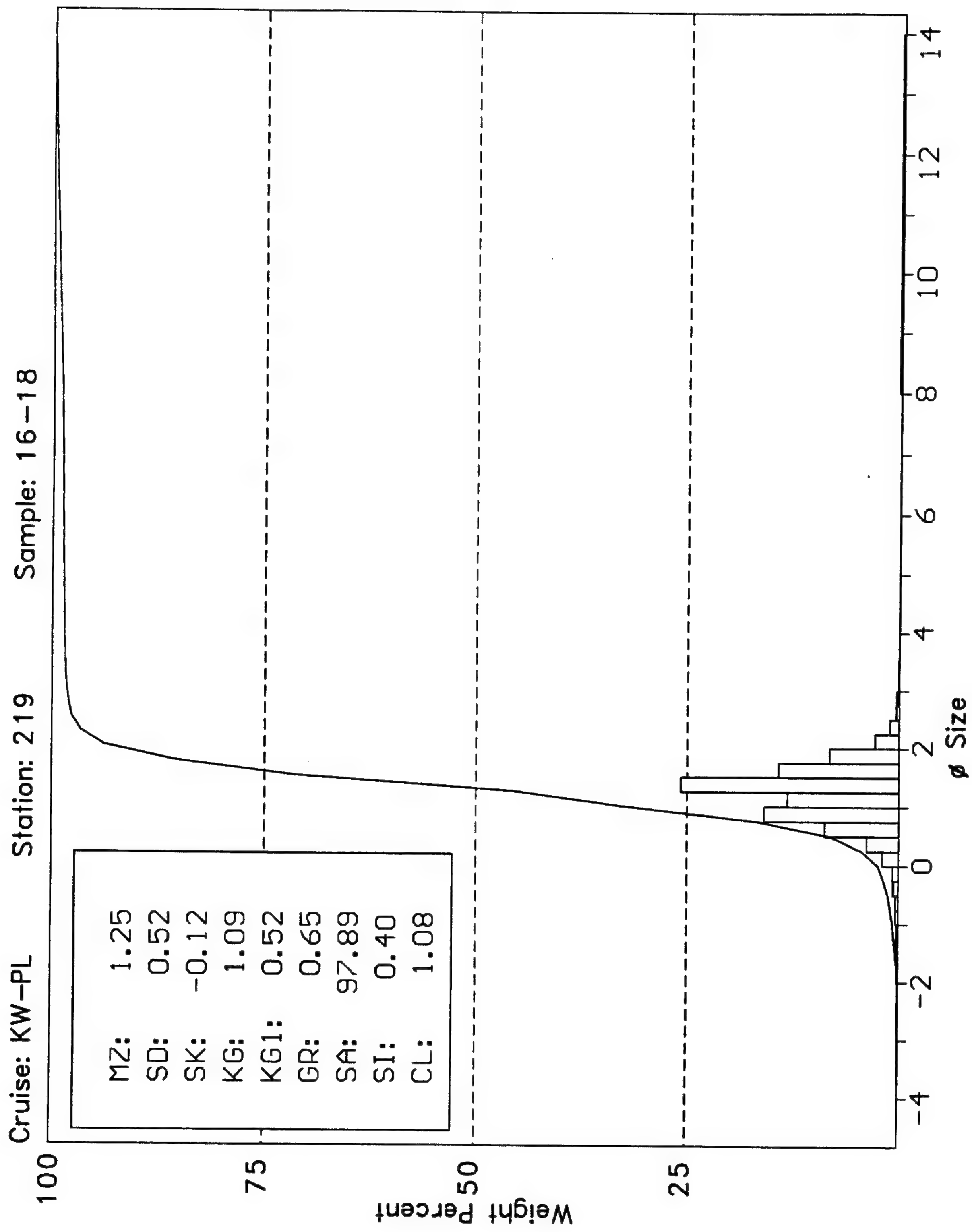


Cruise: KW-PL
Station: 219
Sample: 10-12
MZ: 1.24
SD: 0.43
SK: -0.11
KG: 1.02
KG1: 0.50
GR: 0.13
SA: 98.87
SI: 0.24
CL: 0.78
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

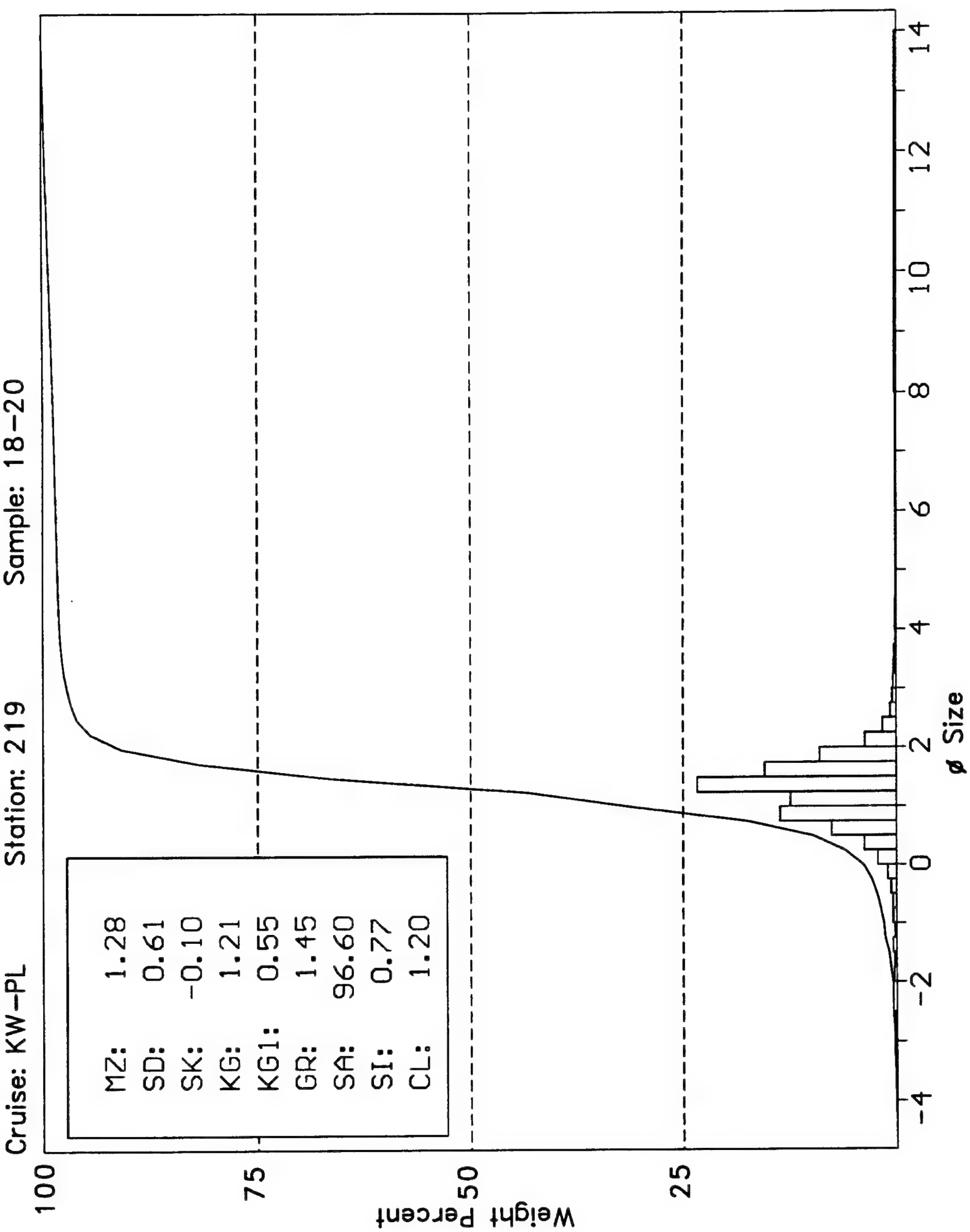

Cruise: KW-PL
Station: 219
Sample: 12-14
MZ: 1.20
SD: 0.44
SK: -0.03
KG: 1.01
KG1: 0.50
GR: 0.04
SA: 98.63
SI: 0.40
CL: 0.96
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

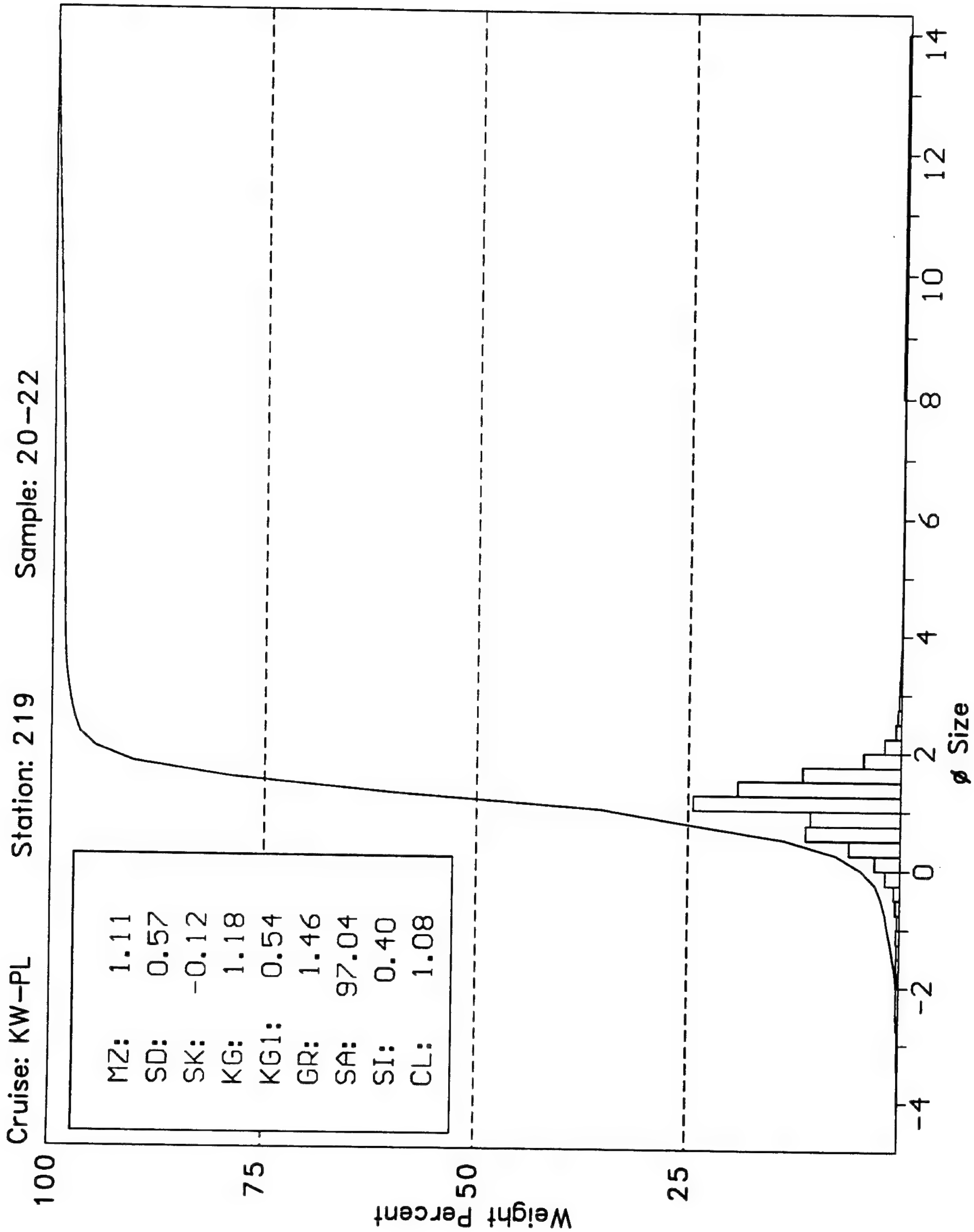


Cruise: KW-PL
Station: 219
Sample: 14-16
MZ: 1.25
SD: 0.47
SK: -0.03
KG: 1.06
KG1: 0.52
GR: 0.09
SA: 98.30
SI: 0.64
CL: 0.96
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

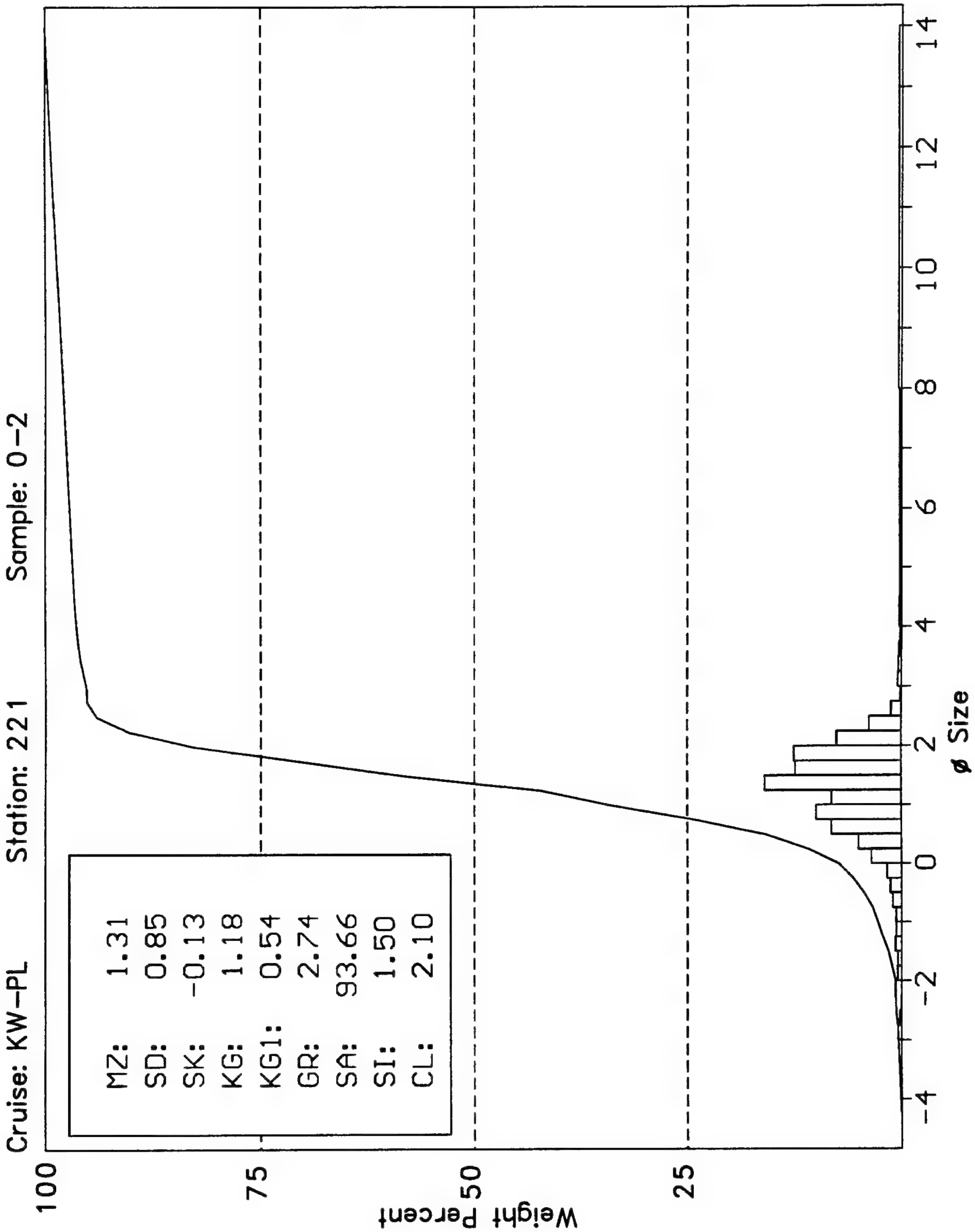


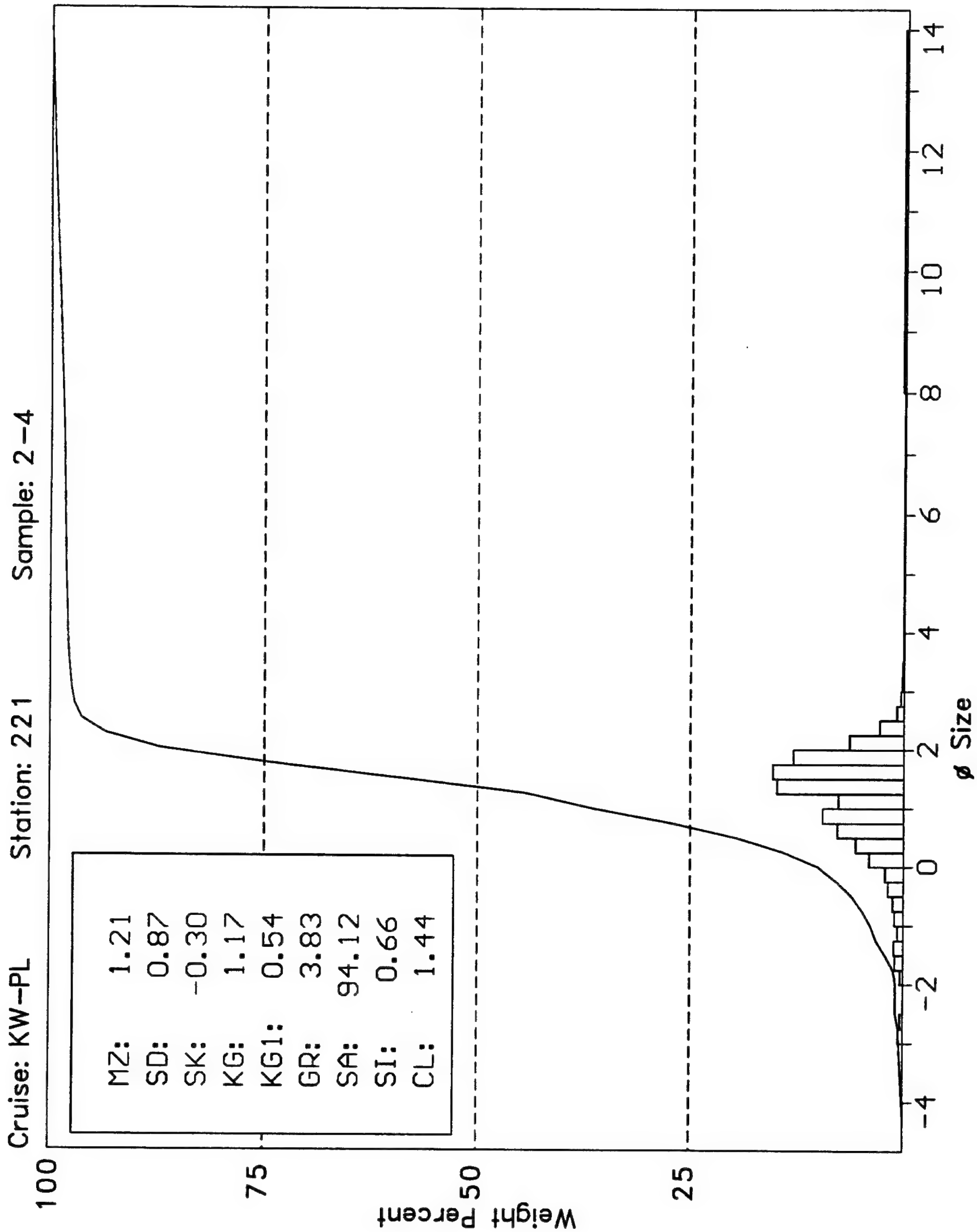
Cruise: KW-PL
Station: 219
Sample: 16-18
MZ: 1.25
SD: 0.52
SK: -0.12
KG: 1.09
KG1: 0.52
GR: 0.65
SA: 97.89
SI: 0.40
CL: 1.08
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

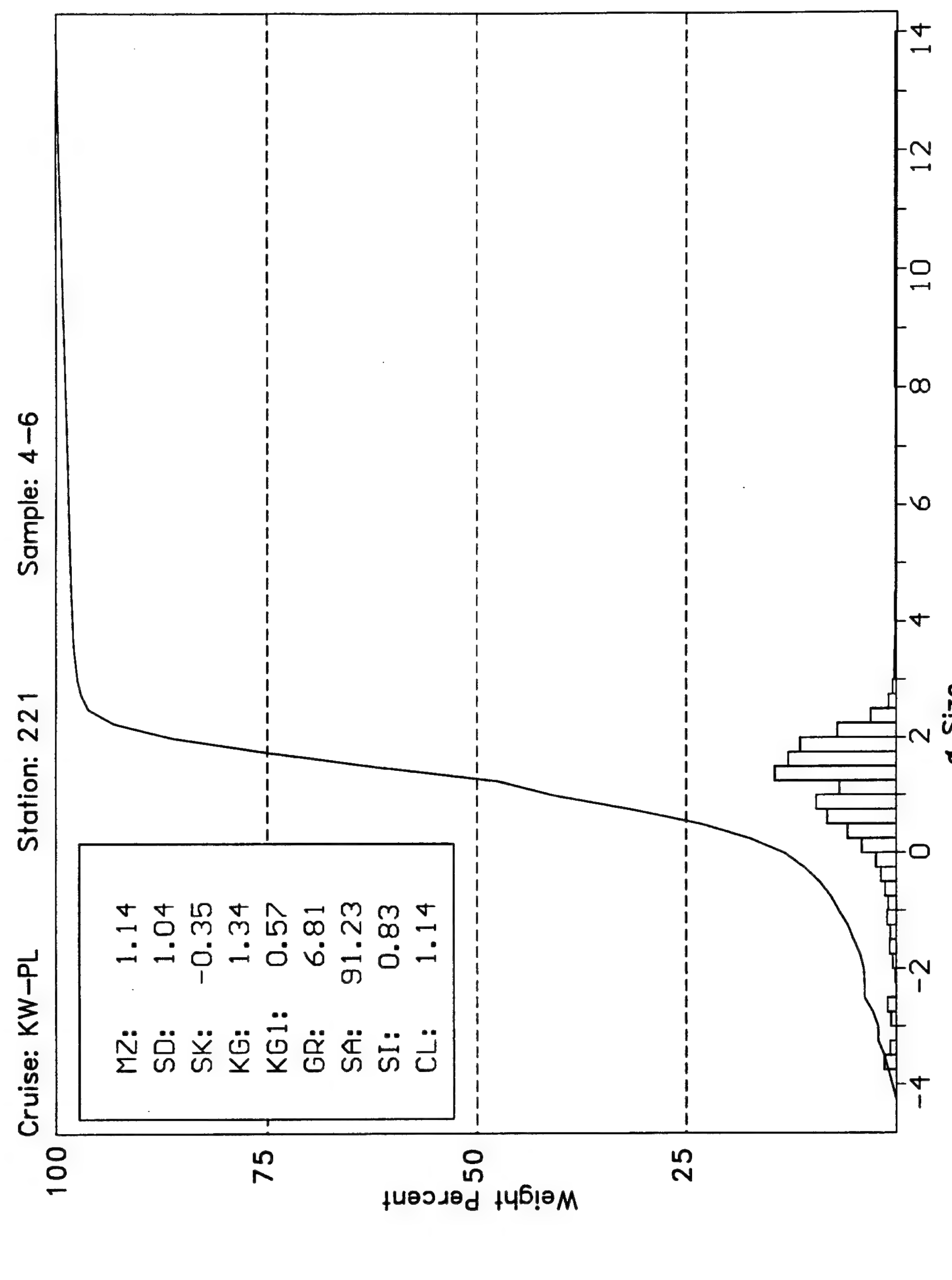

Cruise: KW-PL
Station: 219
Sample: 18-20
MZ: 1.28
SD: 0.61
SK: -0.10
KG: 1.21
KG1: 0.55
GR: 1.45
SA: 96.60
SI: 0.77
CL: 1.20
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

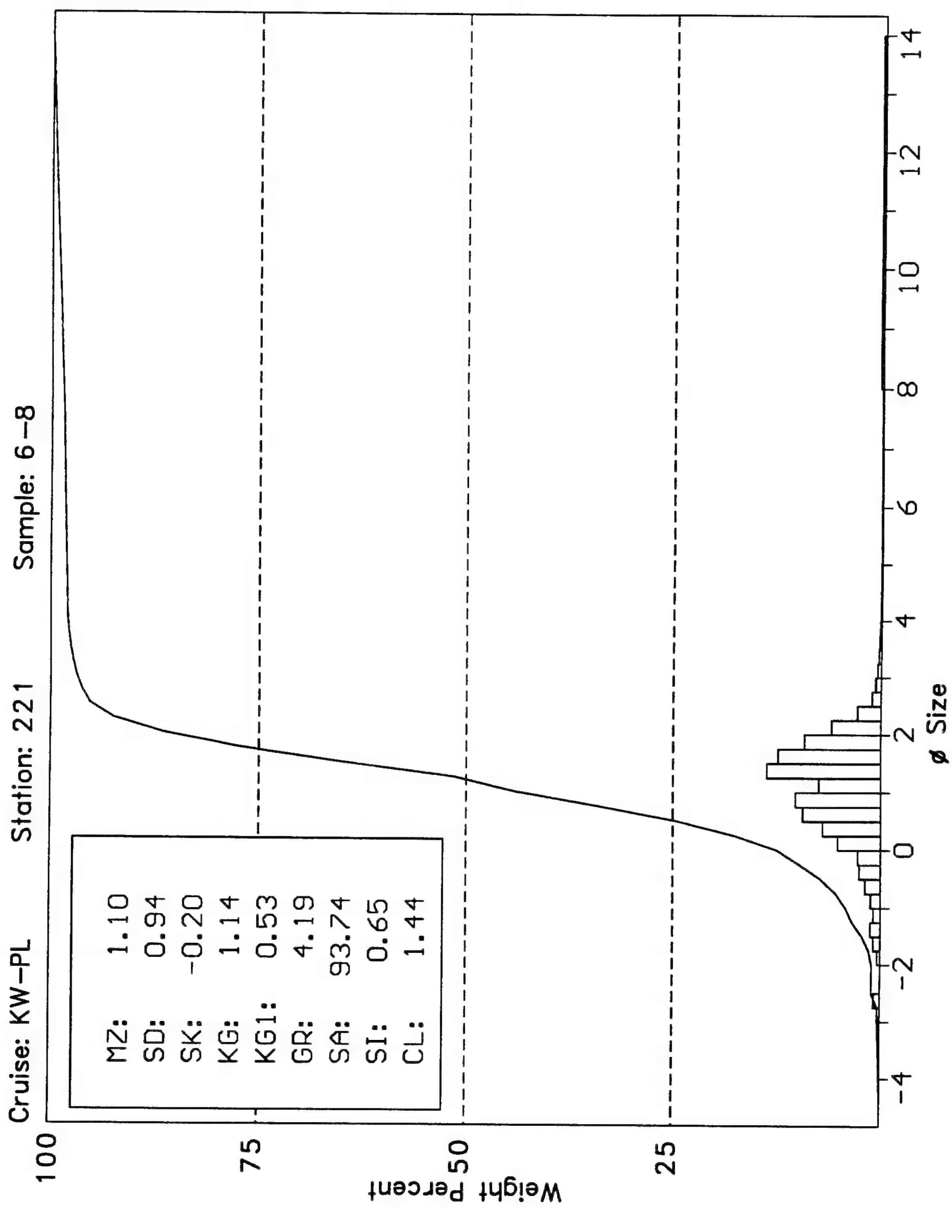


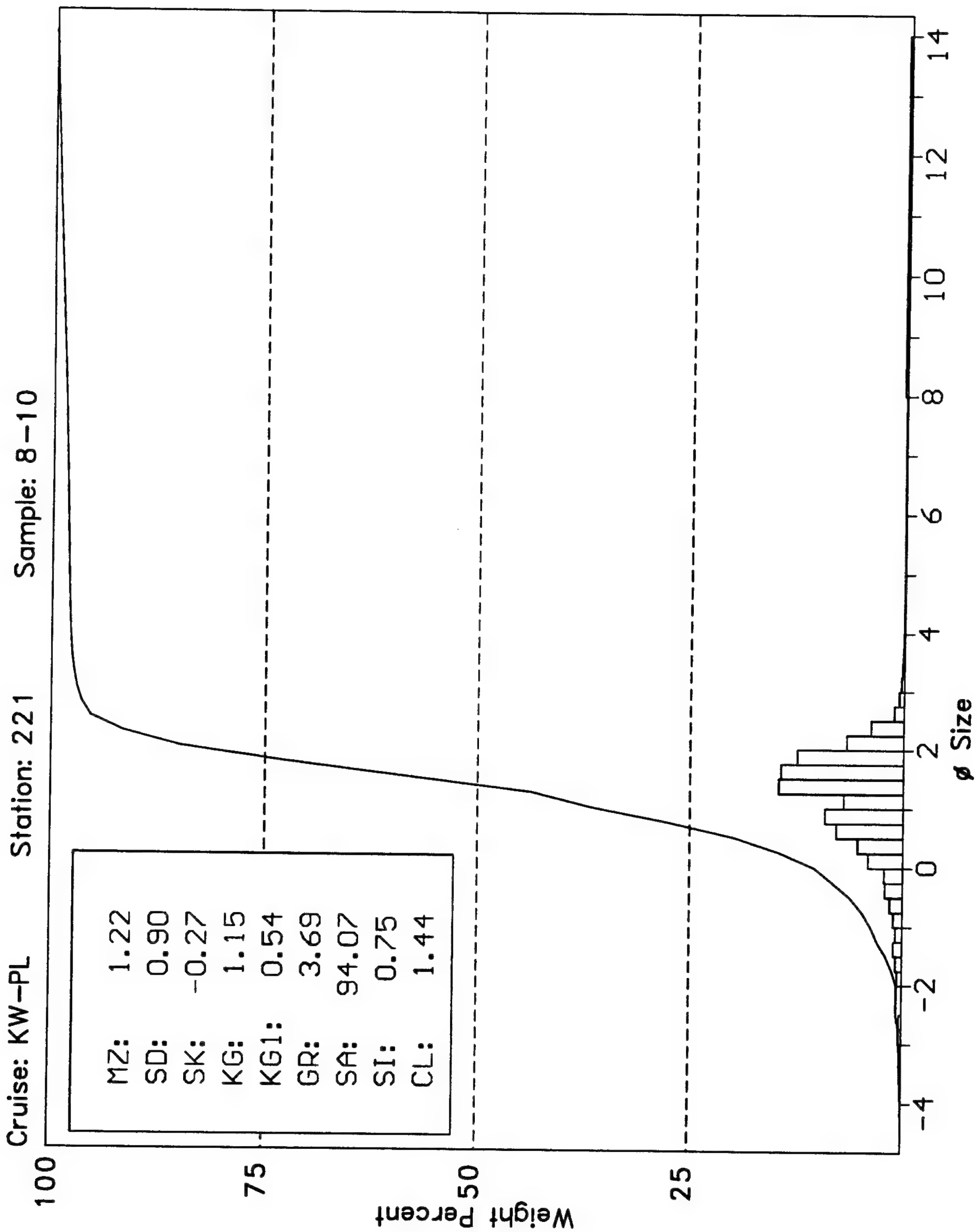
Cruise: KW-PL
Station: 219
Sample: 20-22
MZ: 1.11
SD: 0.57
SK: -0.12
KG: 1.18
KG1: 0.54
GR: 1.46
SA: 97.04
SI: 0.40
CL: 1.08
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

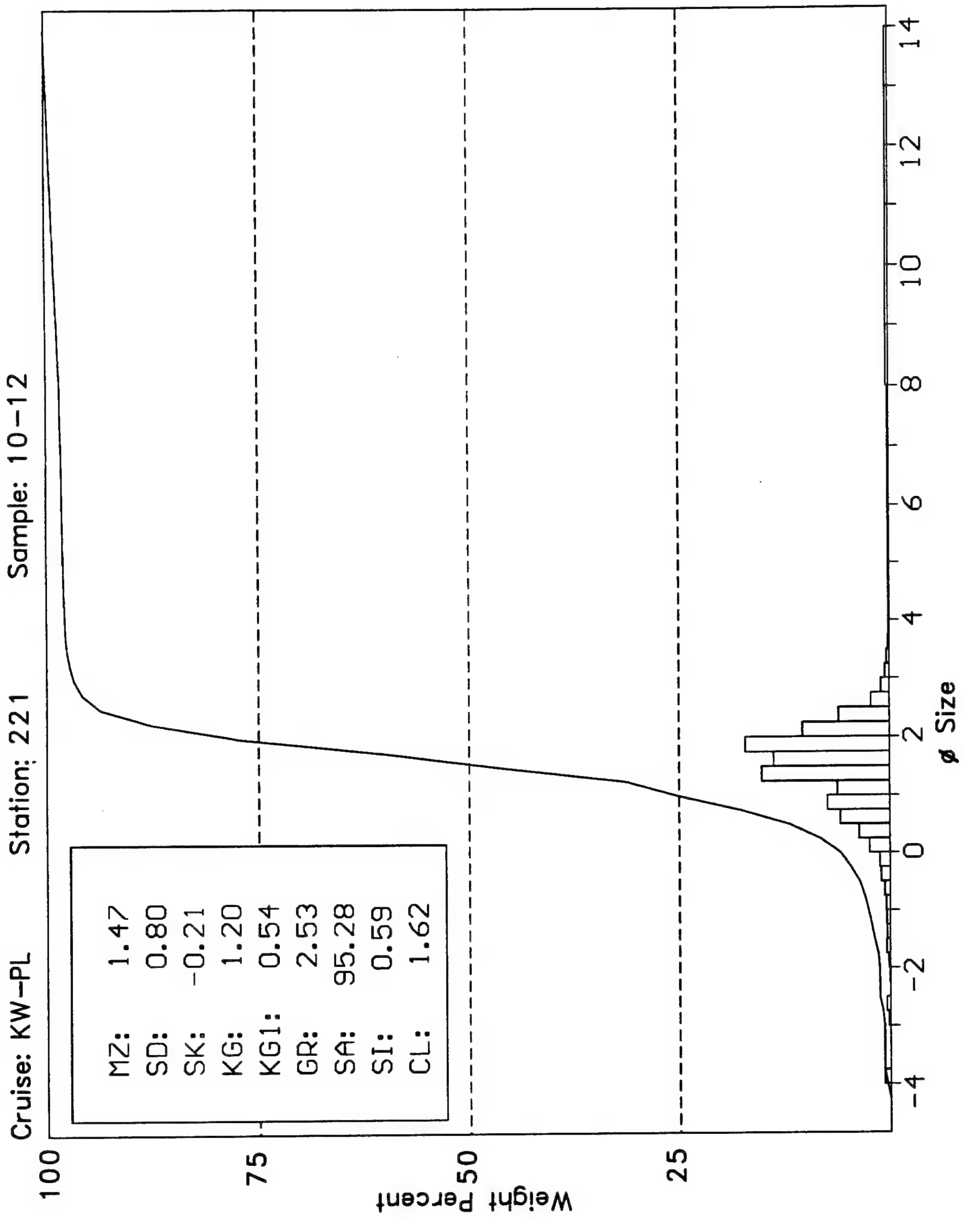

Cruise: KW-PL
Station: 221
Sample: 0-2
MZ: 1.31
SD: 0.85
SK: -0.13
KG: 1.18
KG1: 0.54
GR: 2.74
SA: 93.66
SI: 1.50
CL: 2.10
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14


Cruise: KW-PL
Station: 221
Sample: 2-4
MZ: 1.21
SD: 0.87
SK: -0.30
KG: 1.17
KG1: 0.54
GR: 3.83
SA: 94.12
SI: 0.66
CL: 1.44
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

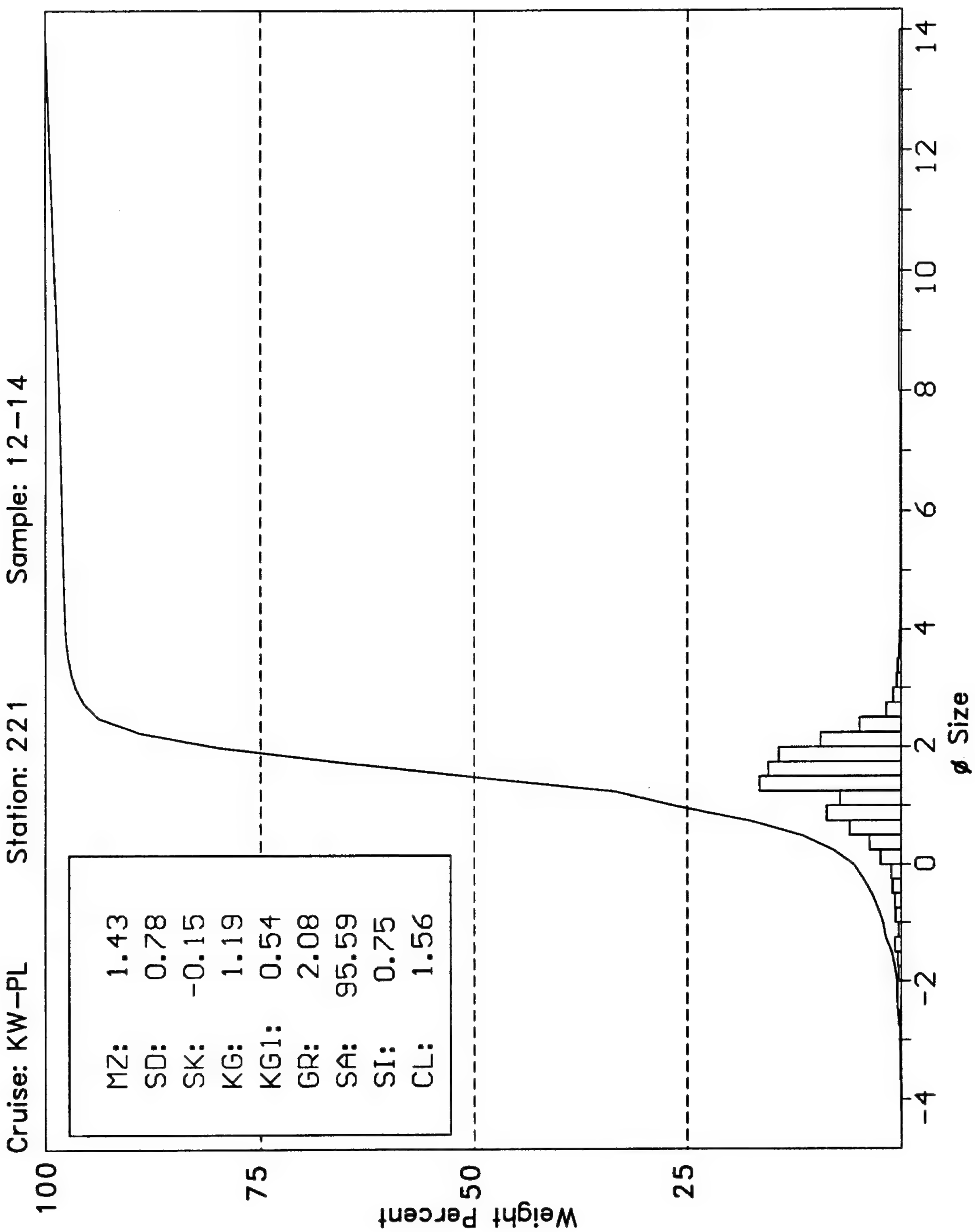

Cruise: KW-PL
Station: 221
Sample: 4-6
MZ: 1.14
SD: 1.04
SK: -0.35
KG: 1.34
KG1: 0.57
GR: 6.81
SA: 91.23
SI: 0.83
CL: 1.14
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14


Cruise: KW–PL
Station: 221
Sample: 6–8
MZ: 1.10
SD: 0.94
SK: -0.20
KG: 1.14
KG1: 0.53
GR: 4.19
SA: 93.74
SI: 0.65
CL: 1.44
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

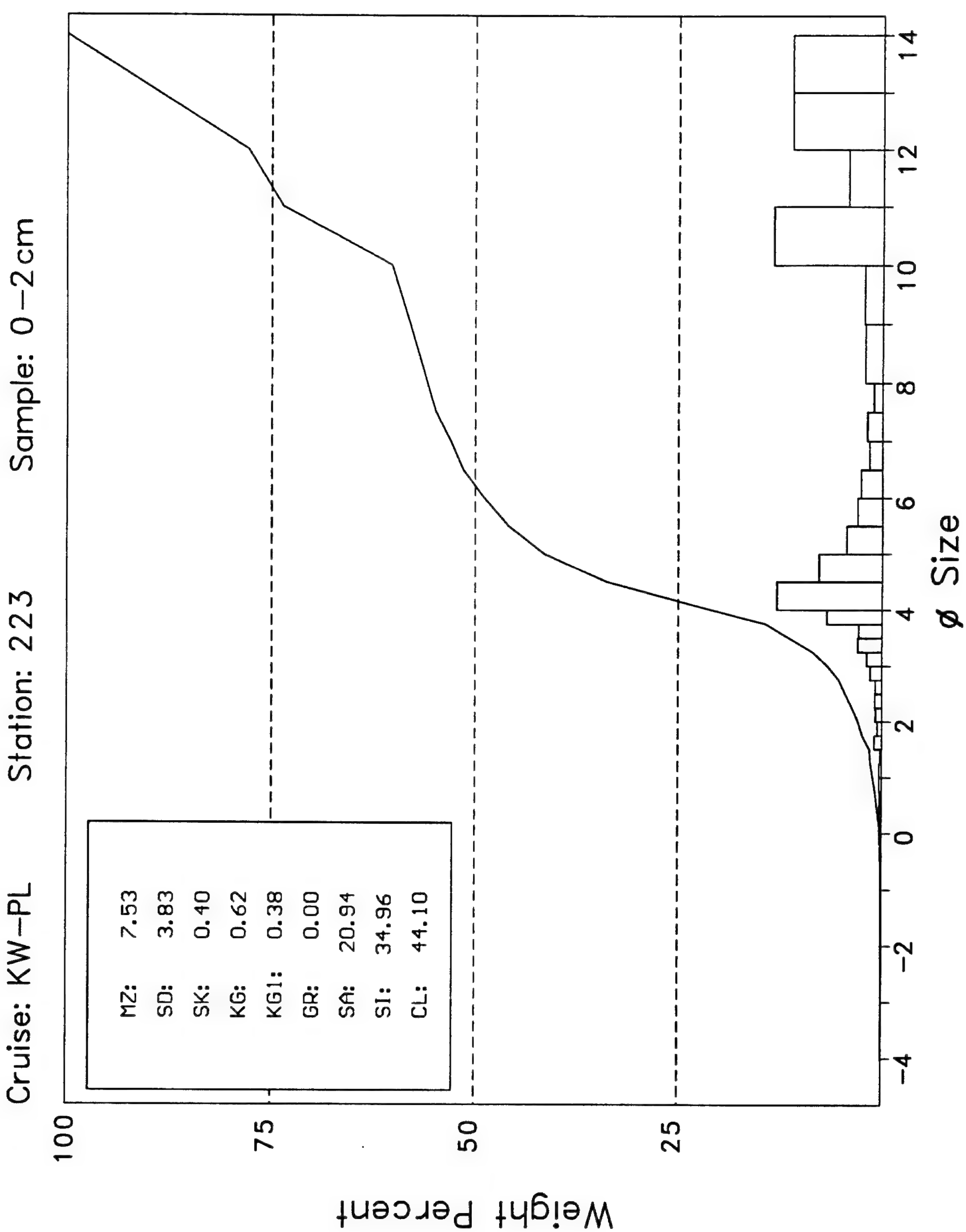

Cruise: KW-PL
Station: 221
Sample: 8-10
MZ: 1.22
SD: 0.90
SK: -0.27
KG: 1.15
KG1: 0.54
GR: 3.69
SA: 94.07
SI: 0.75
CL: 1.44
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size



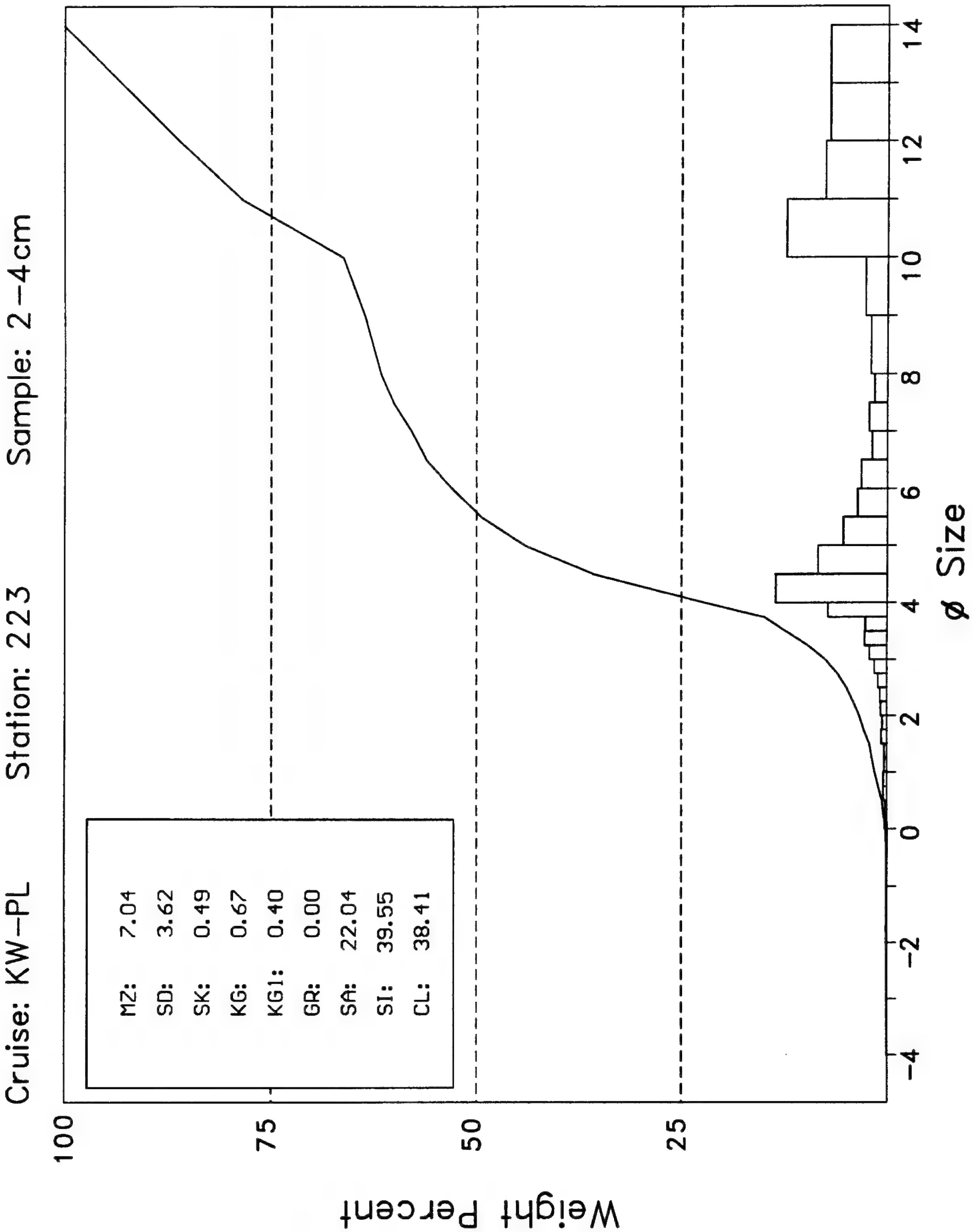
Cruise: KW-PL
Station: 221
Sample: 10-12
MZ: 1.47
SD: 0.80
SK: -0.21
KG: 1.20
KG1: 0.54
GR: 2.53
SA: 95.28
SI: 0.59
CL: 1.62
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

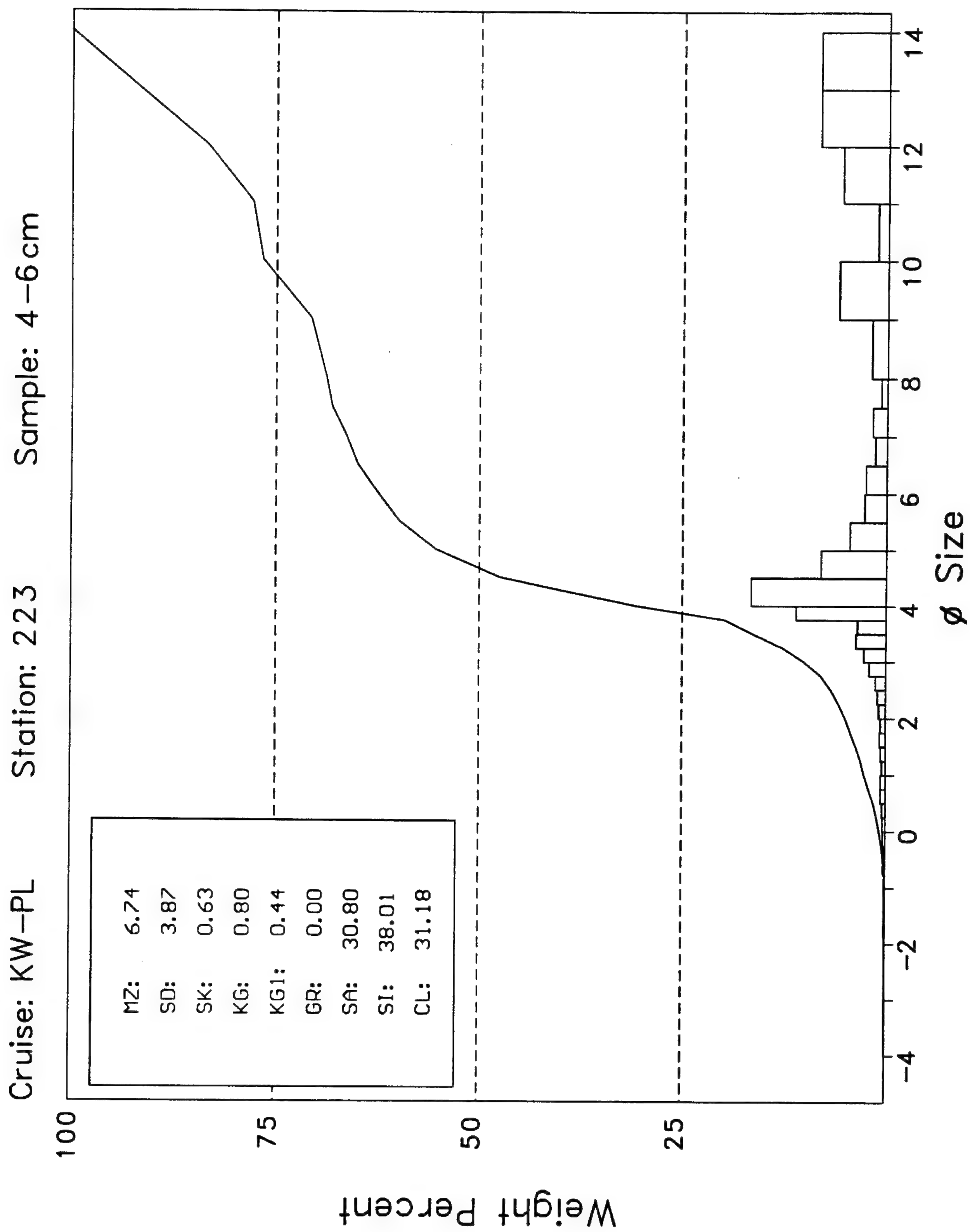


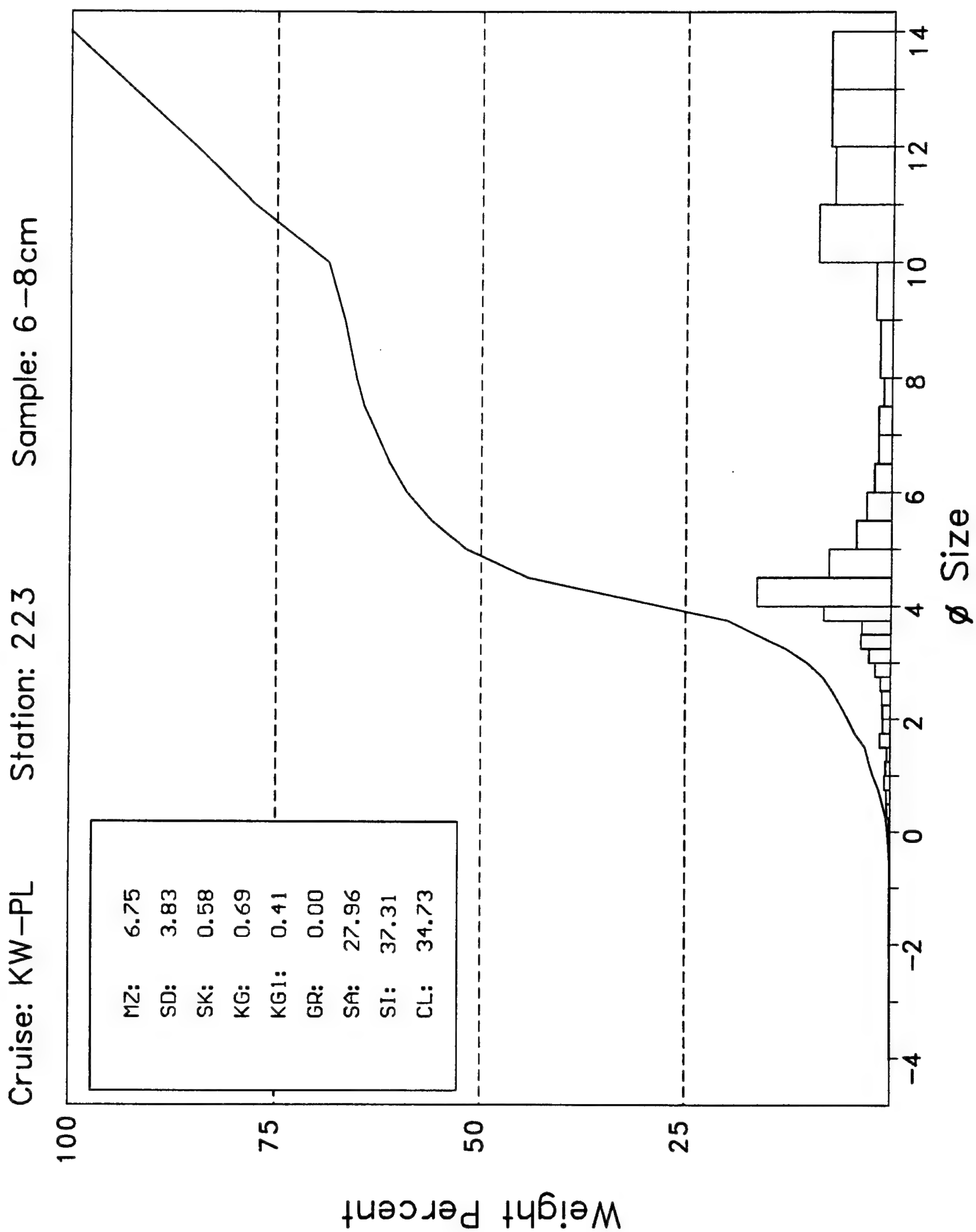
Cruise: KW-PL
Station: 221
Sample: 12-14
MZ: 1.43
SD: 0.78
SK: -0.15
KG: 1.19
KG1: 0.54
GR: 2.08
SA: 95.59
SI: 0.75
CL: 1.56
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14



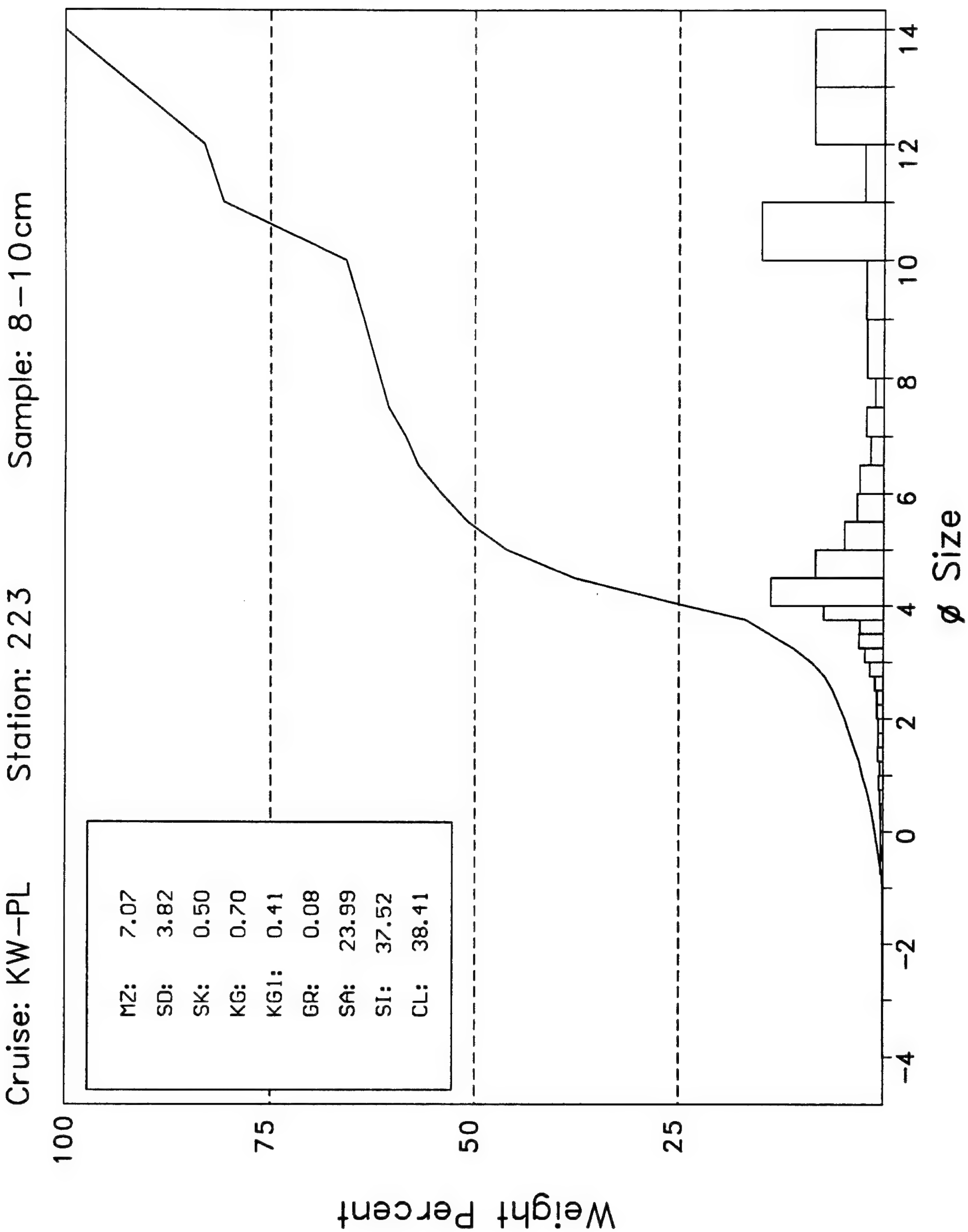
Cruise: KW-PL
Station: 223
Sample: 0-2cm
MZ: 7.53
SD: 3.83
SK: 0.40
KG: 0.62
KG1: 0.38
GR: 0.00
SA: 20.94
SI: 34.96
CL: 44.10
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

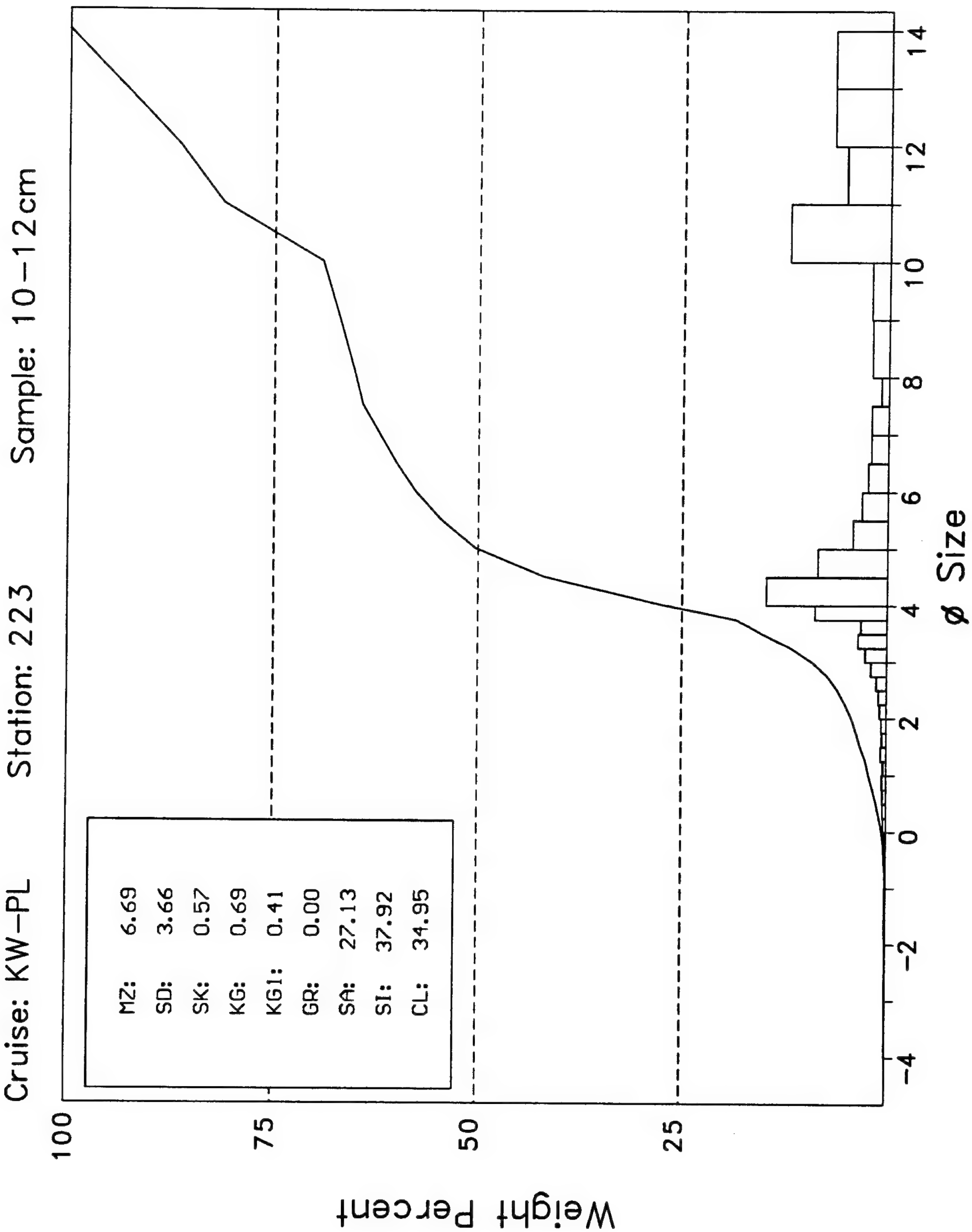

Cruise: KW–PL
Station: 223
Sample: 2–4cm
MZ: 7.04
SD: 3.62
SK: 0.49
KG: 0.67
KG1: 0.40
GR: 0.00
SA: 22.04
SI: 39.55
CL: 38.41
Weight Percent
100
75
50
25
ϕ Size
-4
-2
0
2
4
6
8
10
12
14


Cruise: KW-PL
Station: 223
Sample: 4 -6 cm
MZ: 6.74
SD: 3.87
SK: 0.63
KG: 0.80
KG1: 0.44
GR: 0.00
SA: 30.80
SI: 38.01
CL: 31.18
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

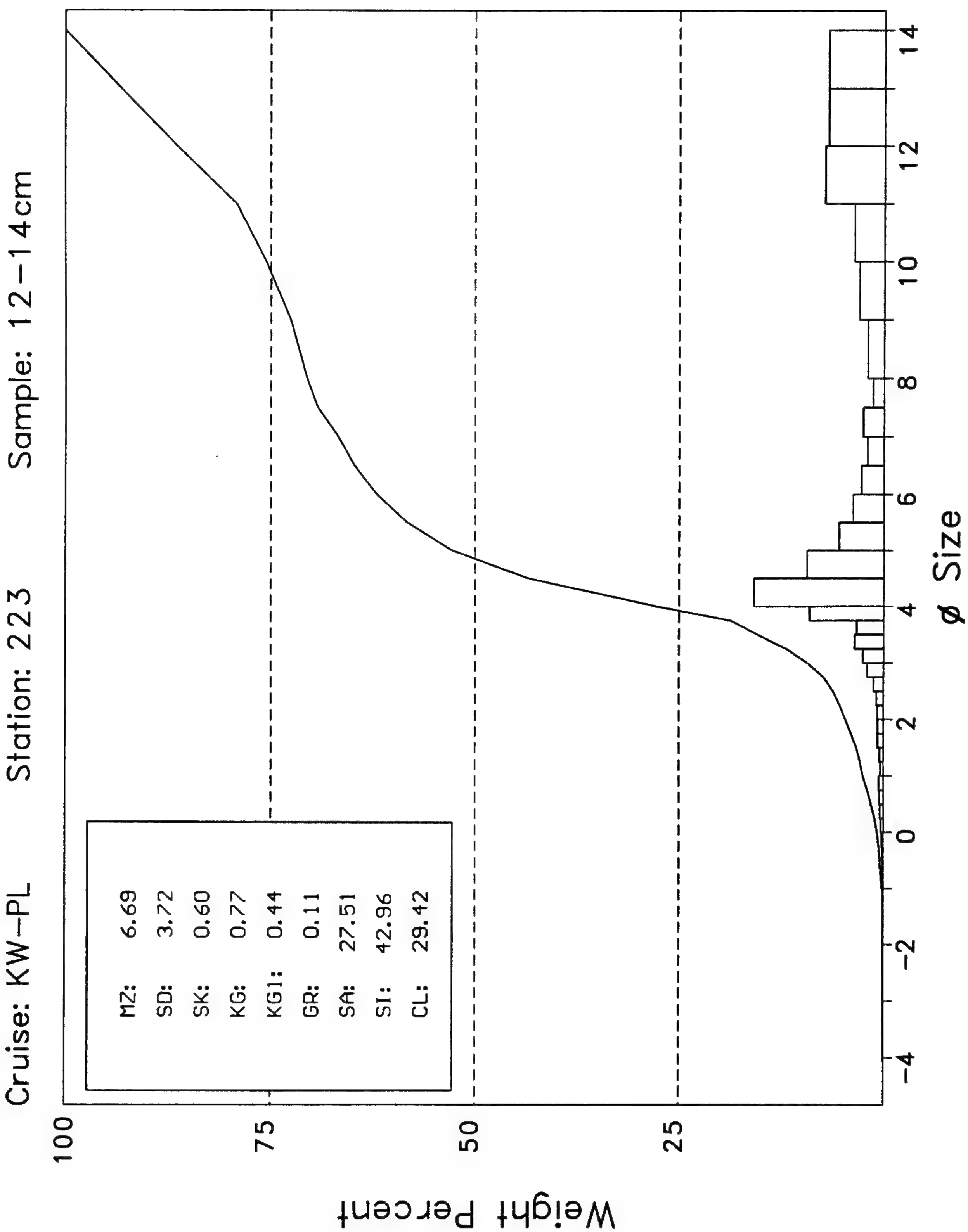


Cruise: KW–PL
Station: 223
Sample: 6–8cm
MZ: 6.75
SD: 3.83
SK: 0.58
KG: 0.69
KG1: 0.41
GR: 0.00
SA: 27.96
SI: 37.31
CL: 34.73
100
75
50
25
Weight Percent
−4
−2
0
2
4
6
8
10
12
14
ø Size

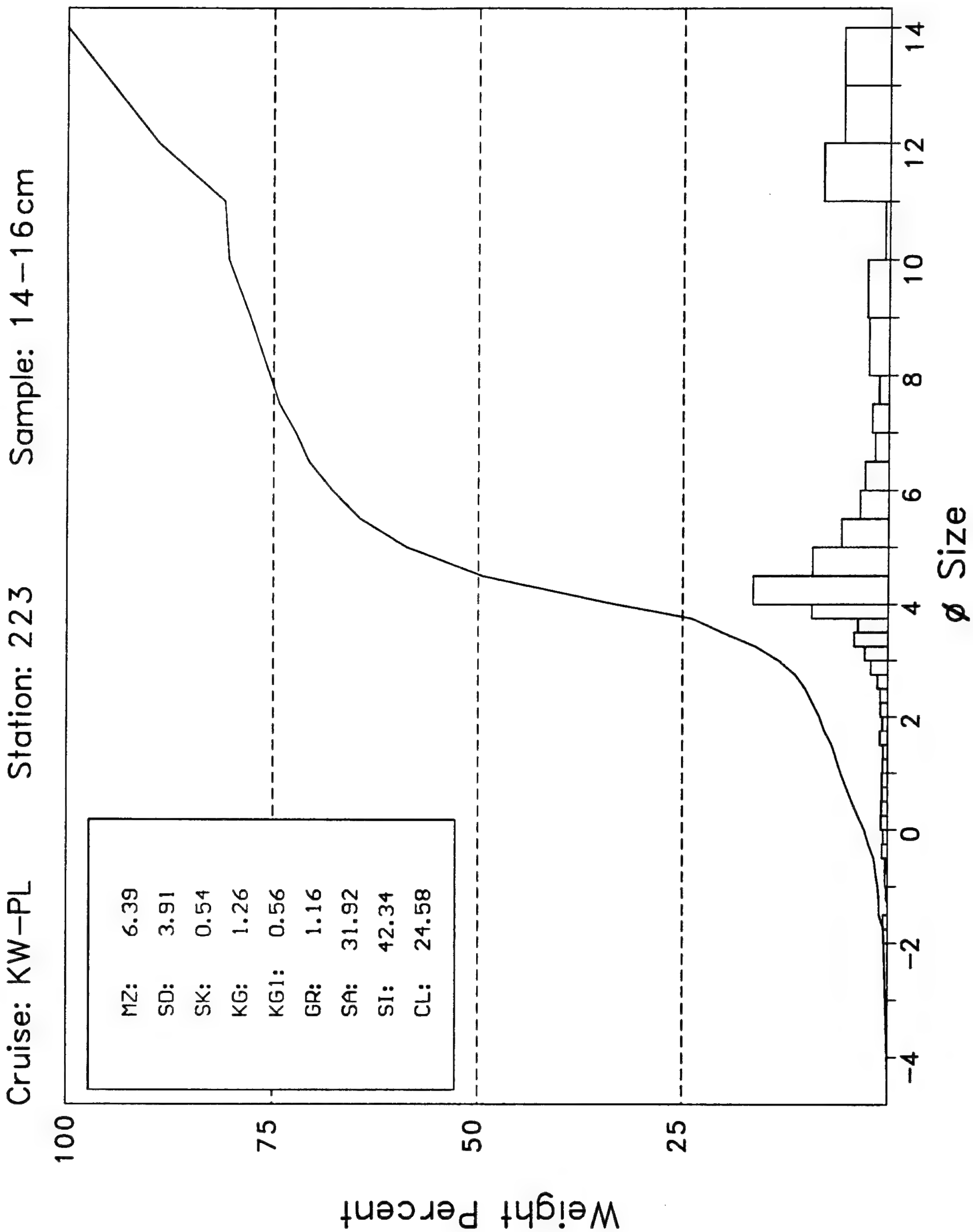

Cruise: KW-PL
Station: 223
Sample: 8-10cm
MZ: 7.07
SD: 3.82
SK: 0.50
KG: 0.70
KG1: 0.41
GR: 0.08
SA: 23.99
SI: 37.52
CL: 38.41
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14



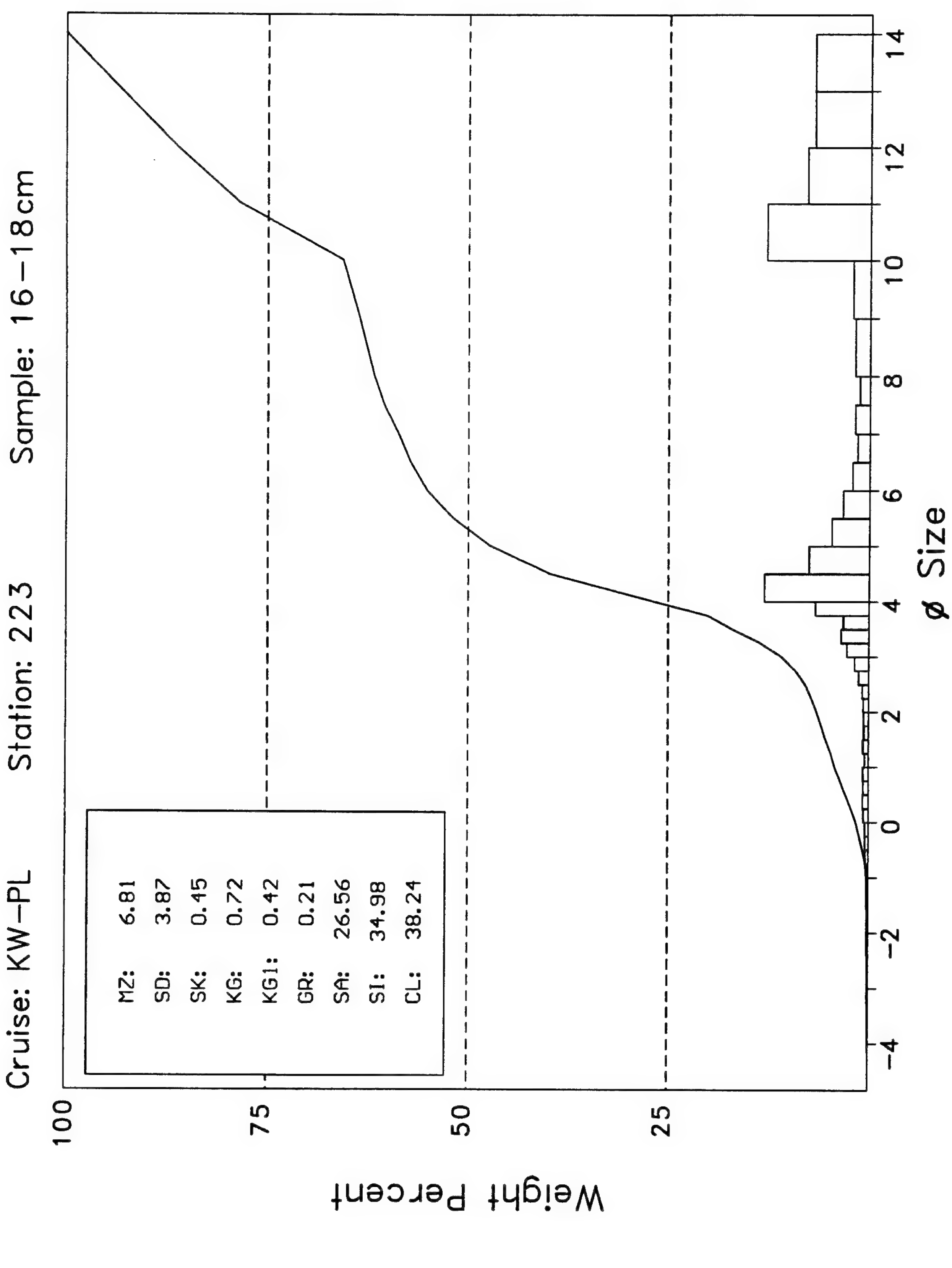
Cruise: KW-PL
Station: 223
Sample: 10-12cm
MZ: 6.69
SD: 3.66
SK: 0.57
KG: 0.69
KGI: 0.41
GR: 0.00
SA: 27.13
SI: 37.92
CL: 34.95
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

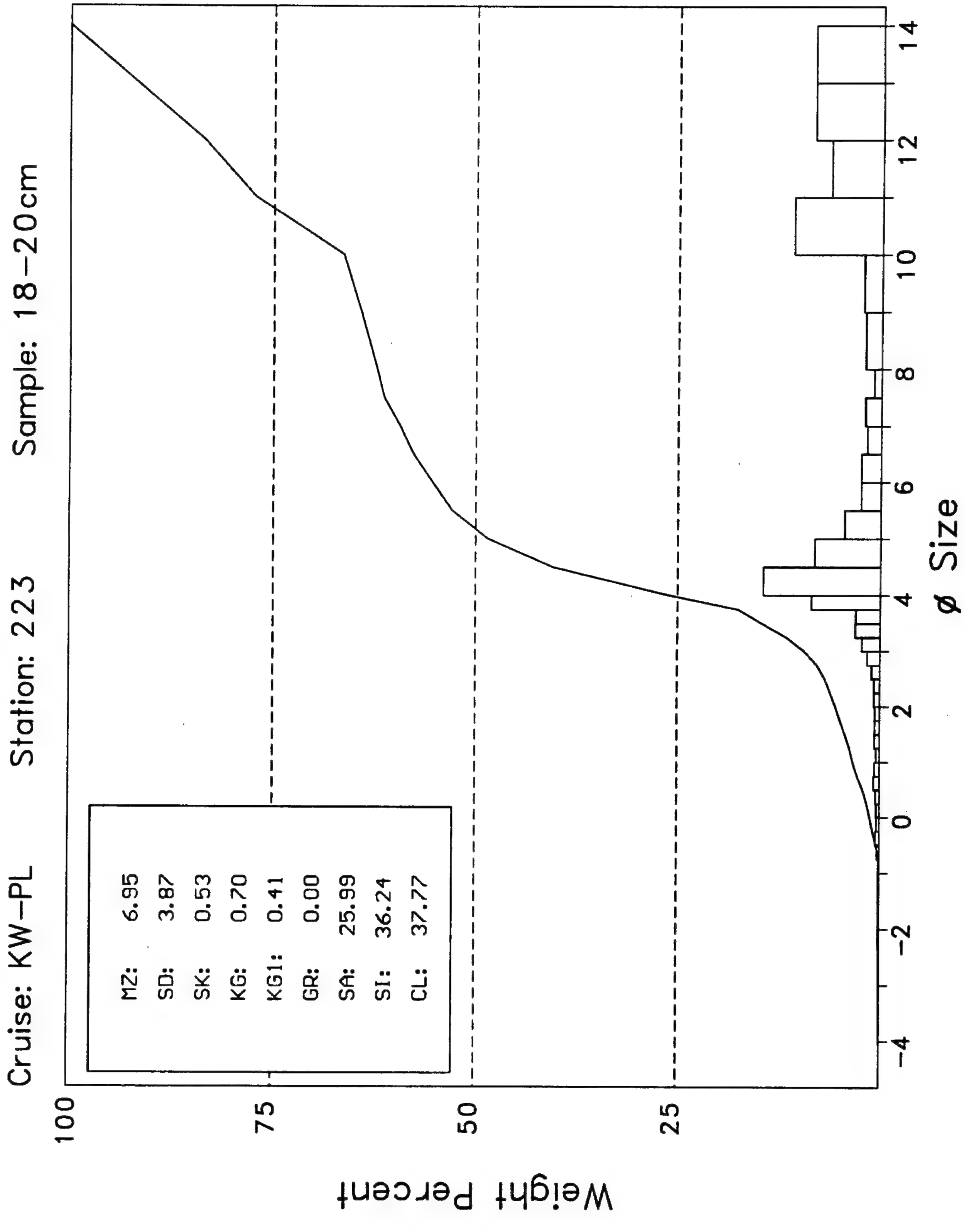


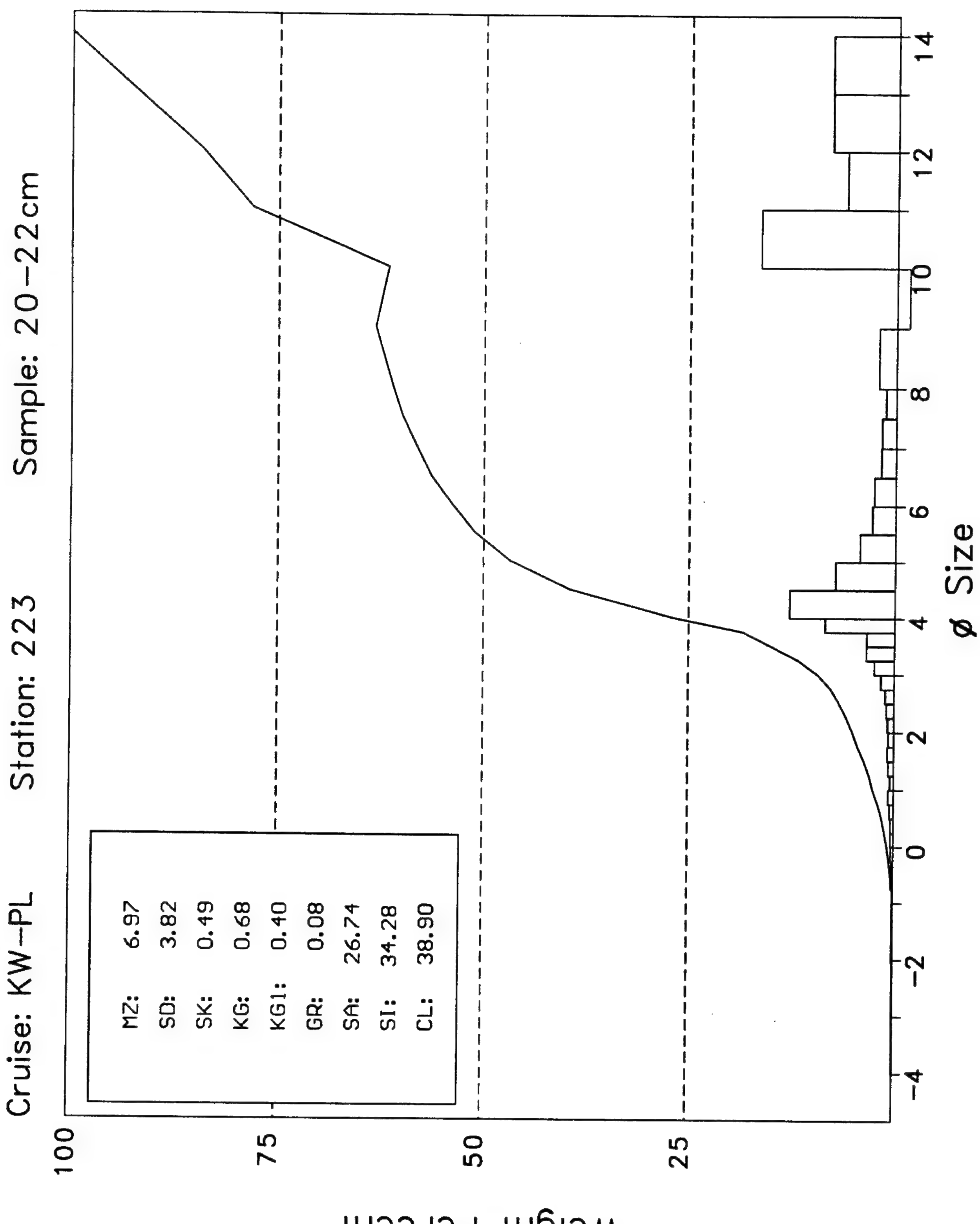
Cruise: KW-PL
Station: 223
Sample: 12-14cm
MZ: 6.69
SD: 3.72
SK: 0.60
KG: 0.77
KG1: 0.44
GR: 0.11
SA: 27.51
SI: 42.96
CL: 29.42
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14



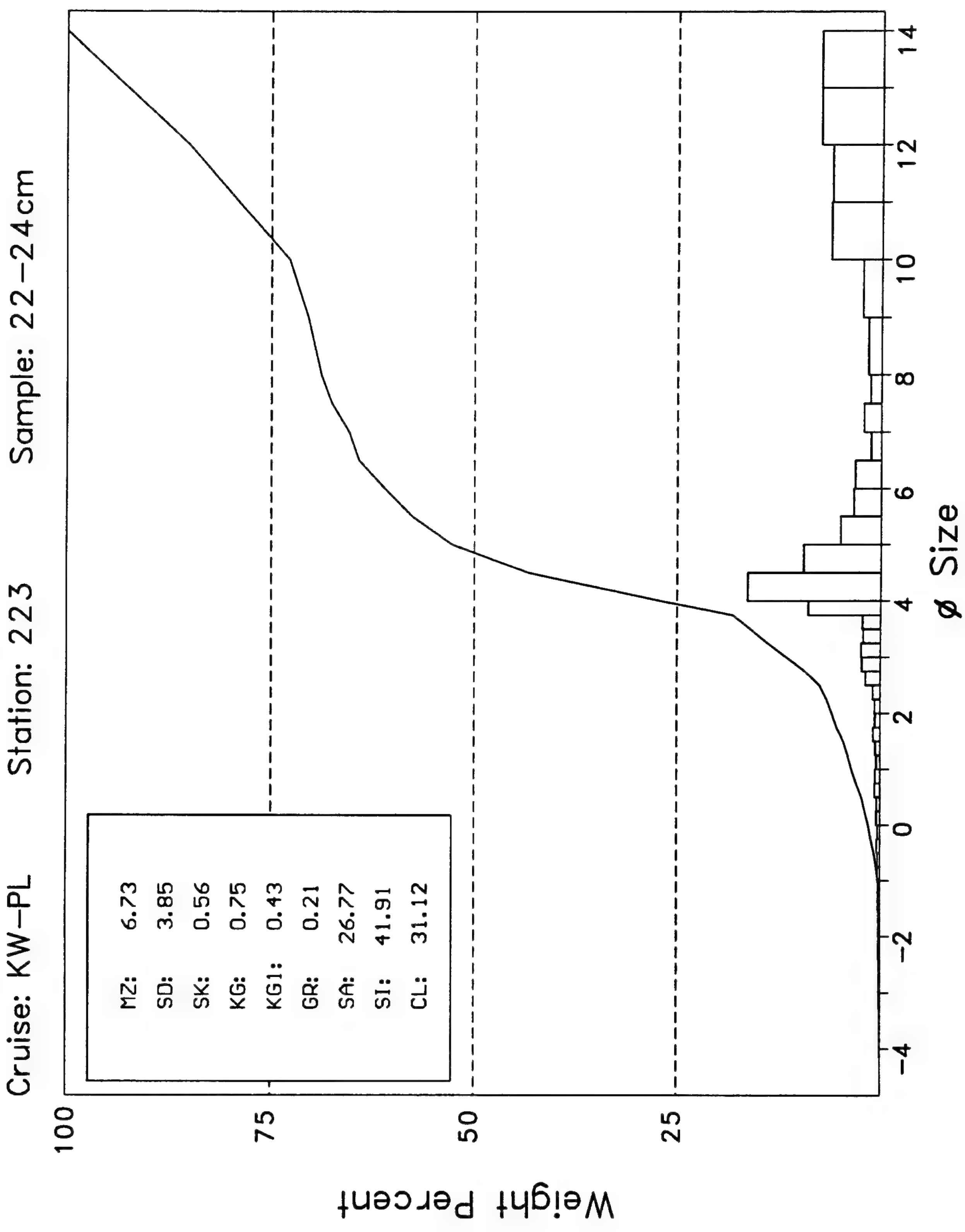
Cruise: KW-PL
Station: 223
Sample: 14-16cm
MZ: 6.39
SD: 3.91
SK: 0.54
KG: 1.26
KG1: 0.56
GR: 1.16
SA: 31.92
SI: 42.34
CL: 24.58
Weight Percent
100
75
50
25
ϕ Size
-4
-2
0
2
4
6
8
10
12
14

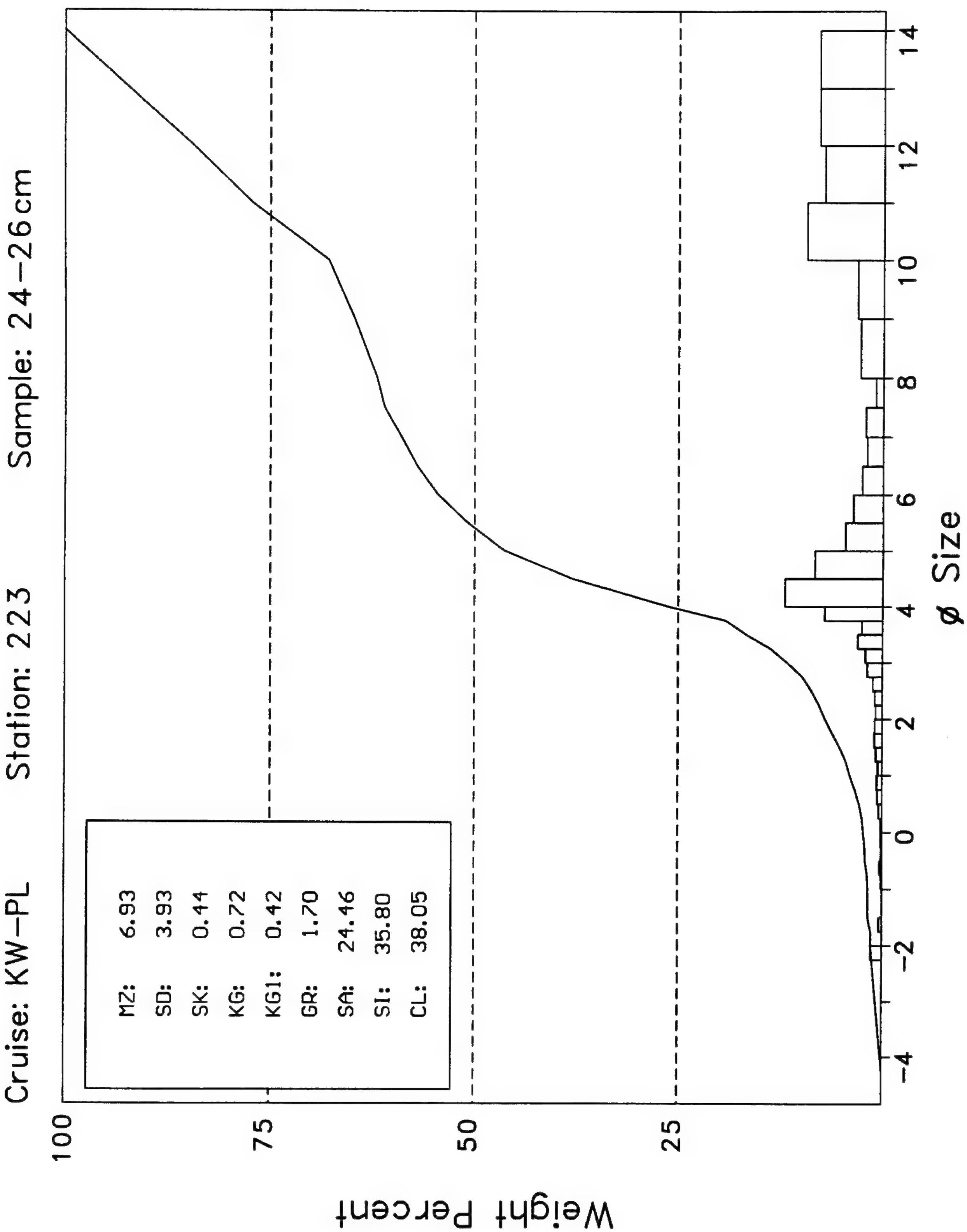

Cruise: KW-PL
Station: 223
Sample: 16-18cm
MZ: 6.81
SD: 3.87
SK: 0.45
KG: 0.72
KG1: 0.42
GR: 0.21
SA: 26.56
SI: 34.98
CL: 38.24
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

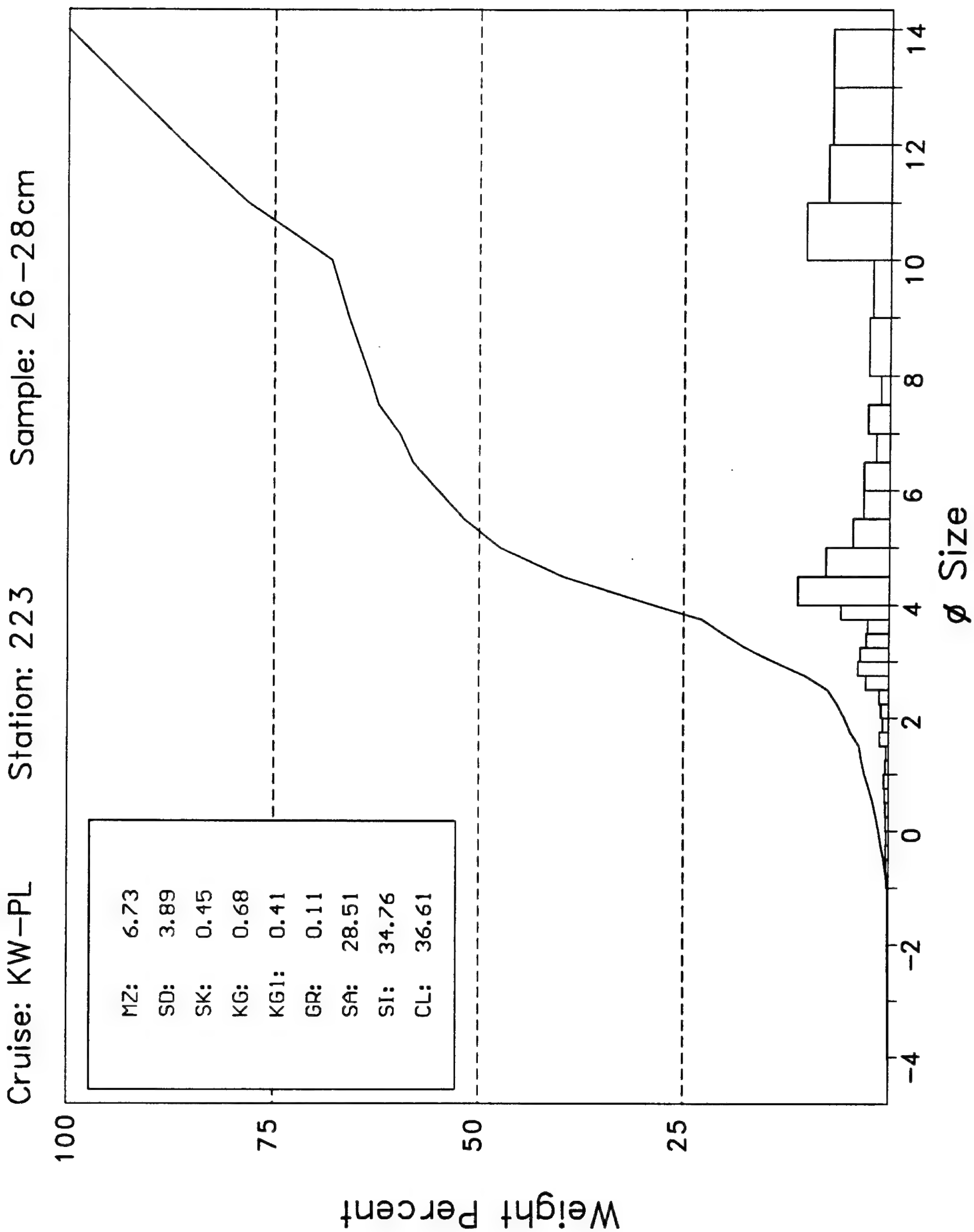

Cruise: KW-PL
Station: 223
Sample: 18-20cm
MZ: 6.95
SD: 3.87
SK: 0.53
KG: 0.70
KG1: 0.41
GR: 0.00
SA: 25.99
SI: 36.24
CL: 37.77
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

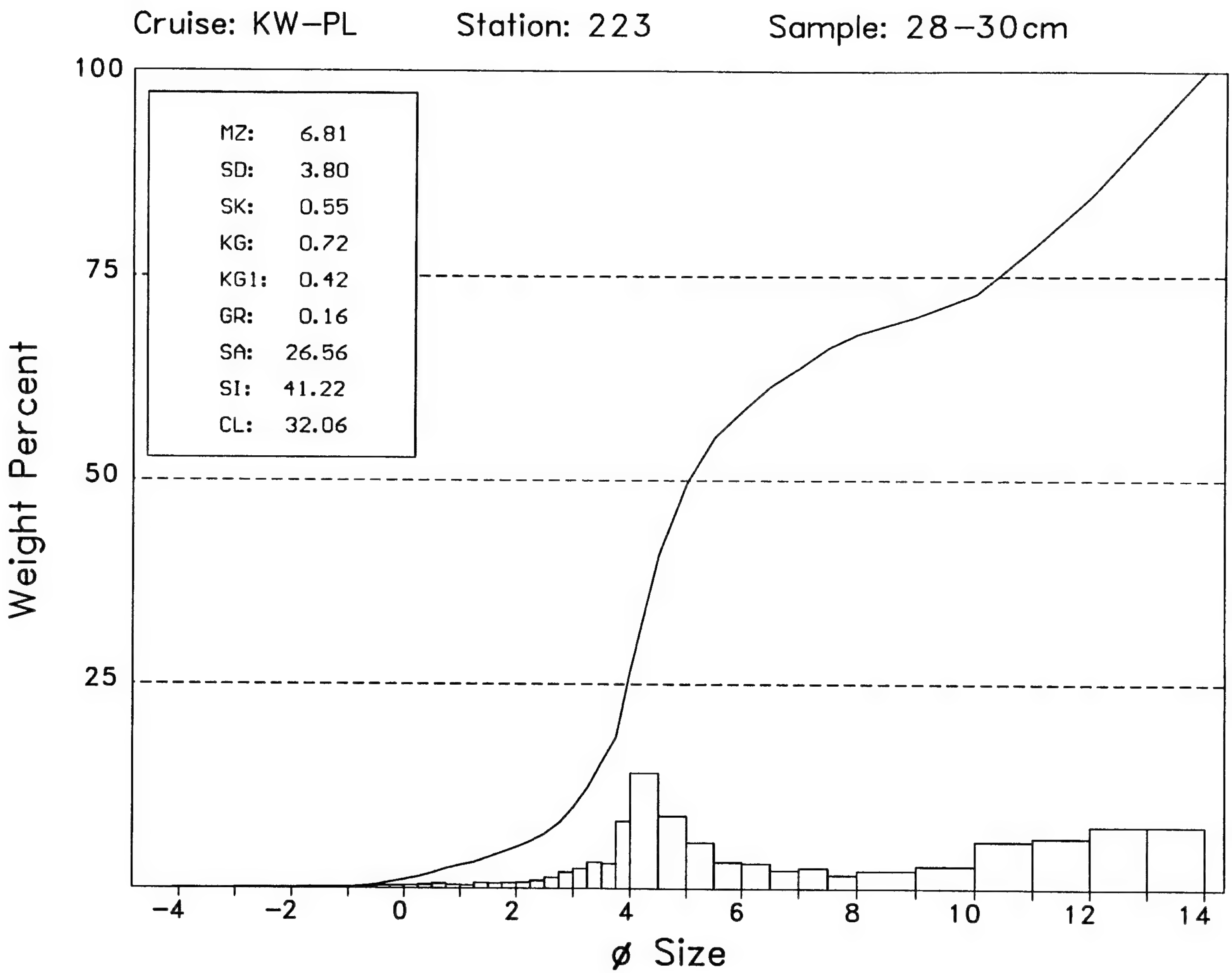


Cruise: KW–PL
Station: 223
Sample: 20–22cm
MZ: 6.97
SD: 3.82
SK: 0.49
KG: 0.68
KG1: 0.40
GR: 0.08
SA: 26.74
SI: 34.28
CL: 38.90
Weight Percent
100
75
50
25
ø Size
–4
–2
0
2
4
6
8
10
12
14

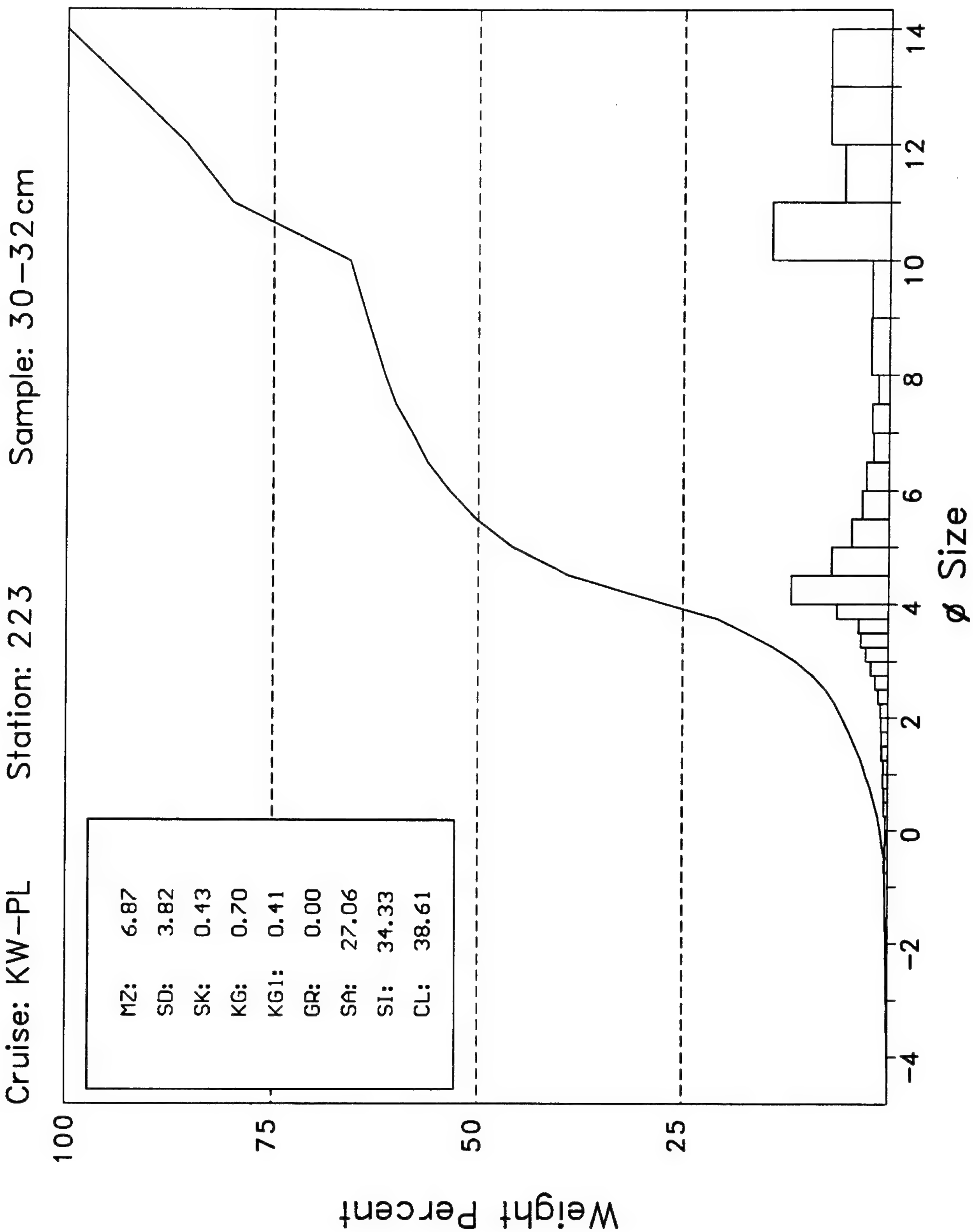

Cruise: KW-PL
Station: 223
Sample: 22-24cm
MZ: 6.73
SD: 3.85
SK: 0.56
KG: 0.75
KG1: 0.43
GR: 0.21
SA: 26.77
SI: 41.91
CL: 31.12
Weight Percent
100
75
50
25
ϕ Size
-4
-2
0
2
4
6
8
10
12
14


Cruise: KW–PL
Station: 223
Sample: 24–26 cm
MZ: 6.93
SD: 3.93
SK: 0.44
KG: 0.72
KG1: 0.42
GR: 1.70
SA: 24.46
SI: 35.80
CL: 38.05
Weight Percent
100
75
50
25
ϕ Size
-4
-2
0
2
4
6
8
10
12
14

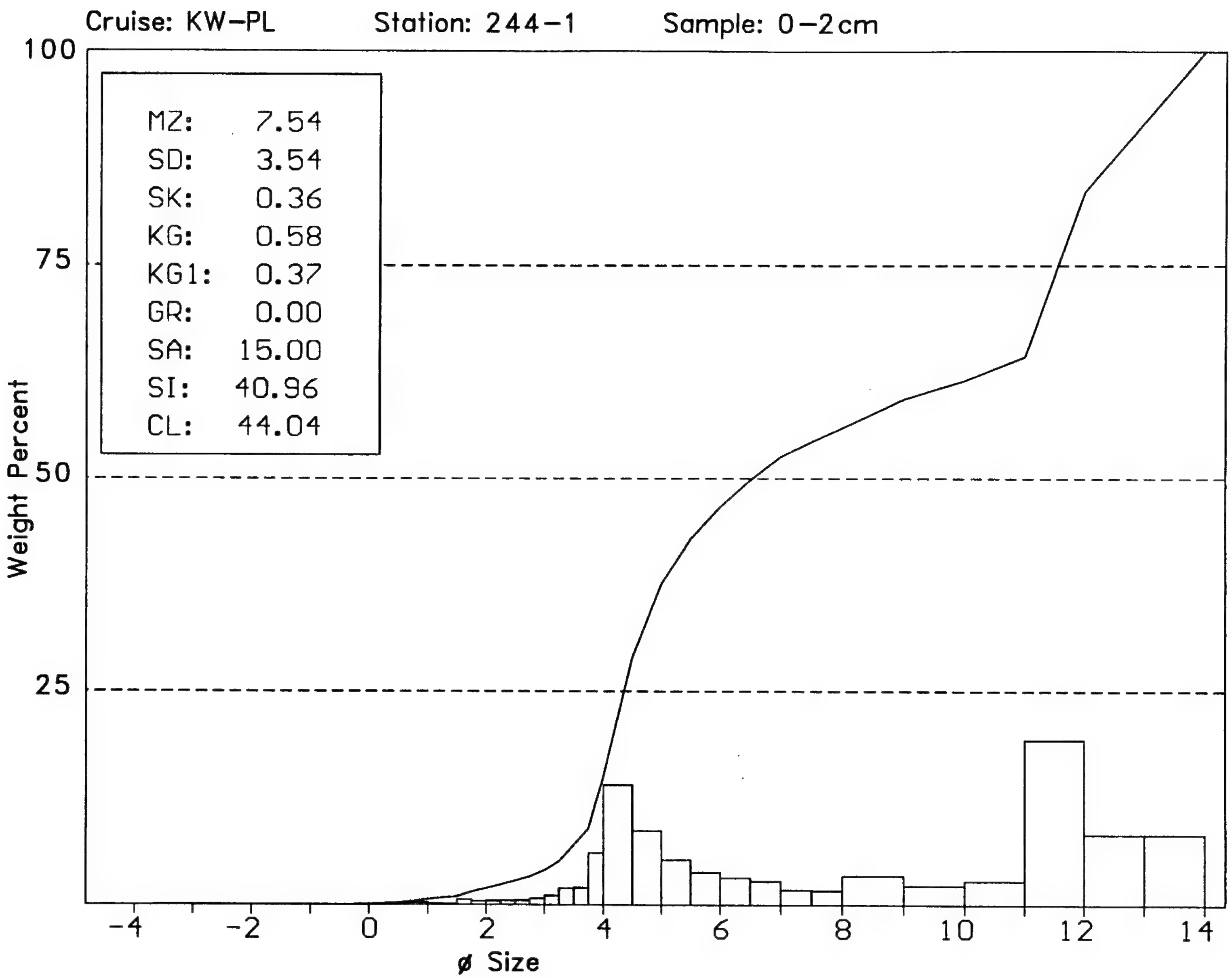

Cruise: KW–PL
Station: 223
Sample: 26–28cm
MZ: 6.73
SD: 3.89
SK: 0.45
KG: 0.68
KG1: 0.41
GR: 0.11
SA: 28.51
SI: 34.76
CL: 36.61
Weight Percent
100
75
50
25
ø Size
−4
−2
0
2
4
6
8
10
12
14

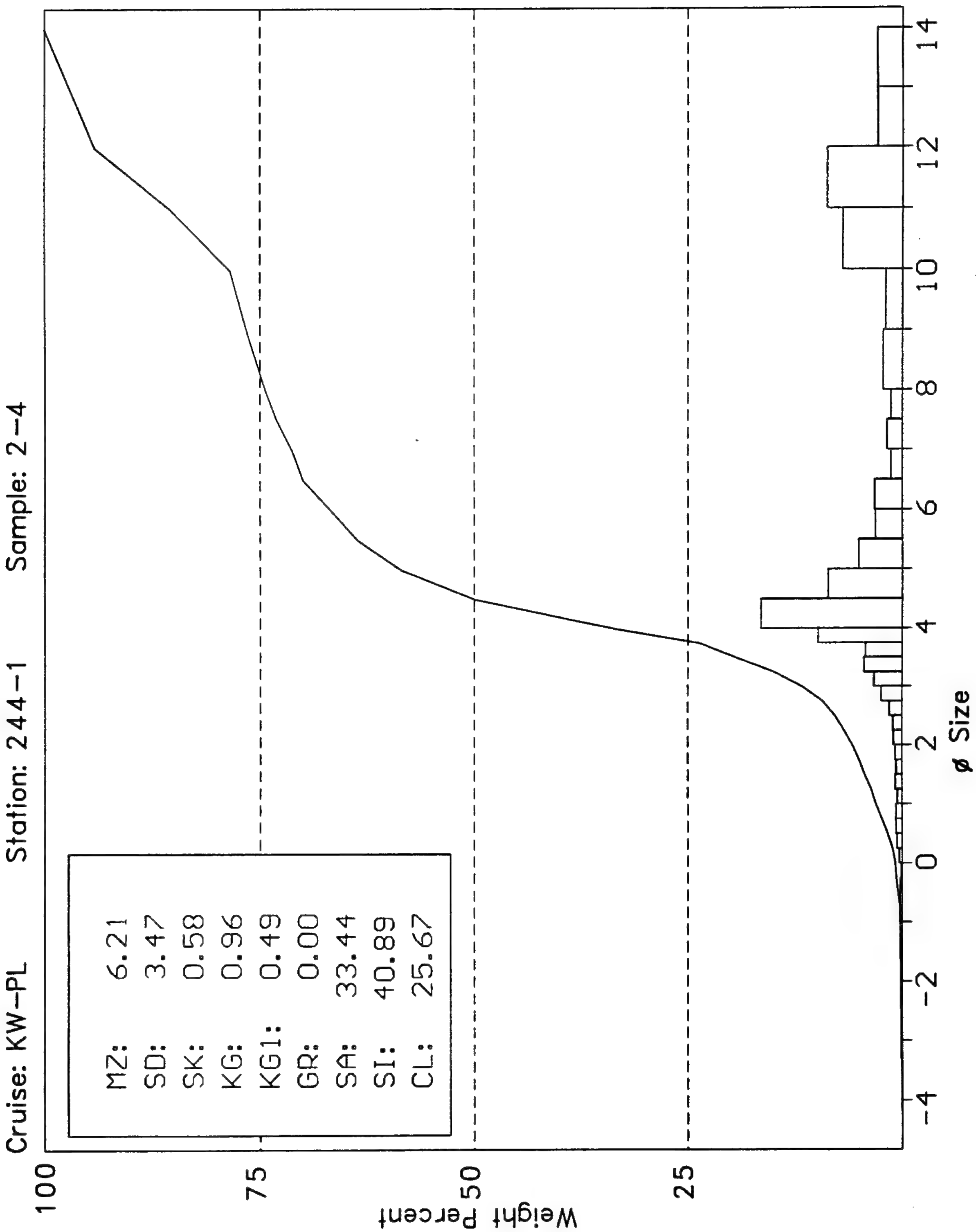


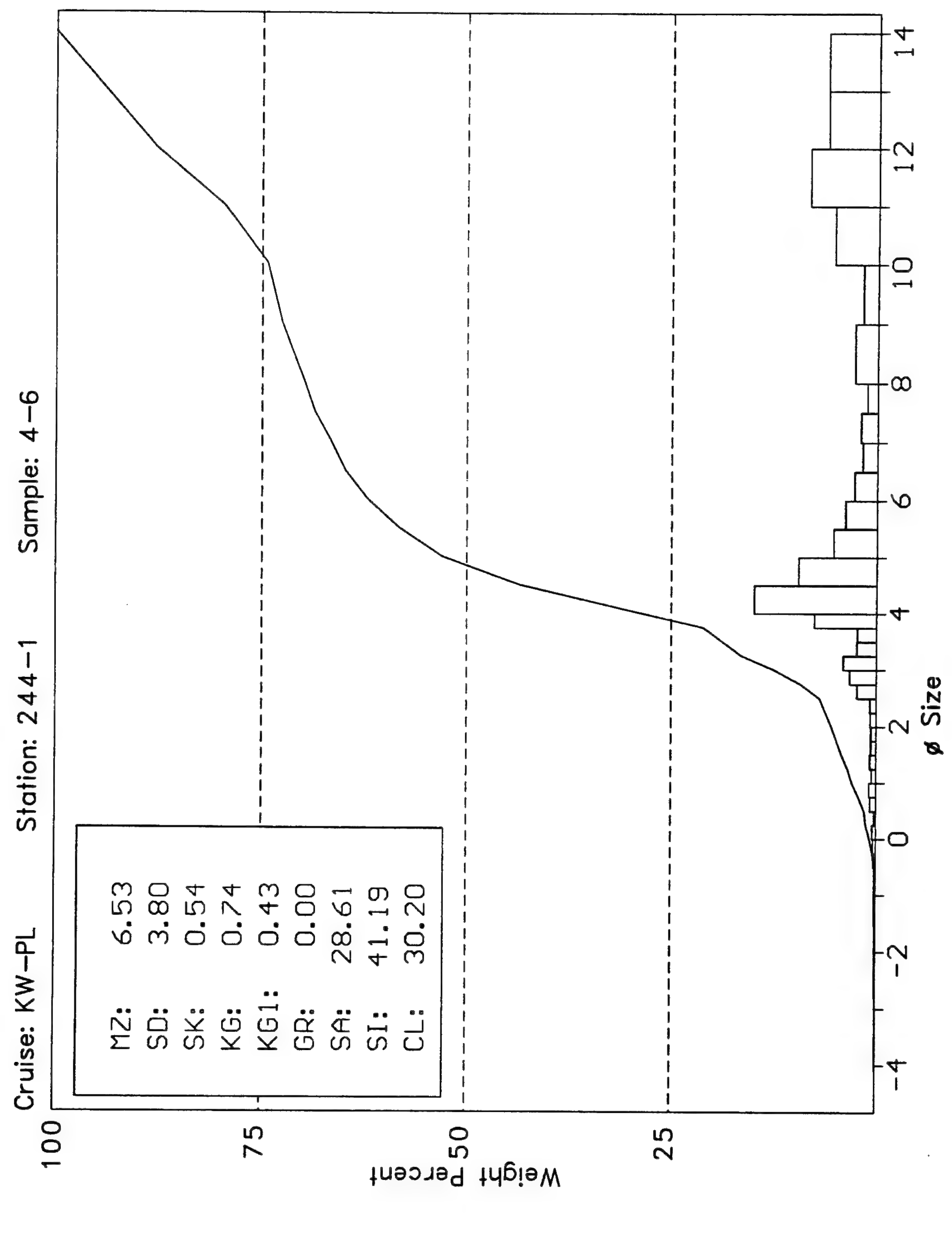
Cruise: KW–PL
Station: 223
Sample: 28–30cm
100
75
50
25
Weight Percent
MZ: 6.81
SD: 3.80
SK: 0.55
KG: 0.72
KG1: 0.42
GR: 0.16
SA: 26.56
SI: 41.22
CL: 32.06
–4
–2
0
2
4
6
8
10
12
14
ø Size



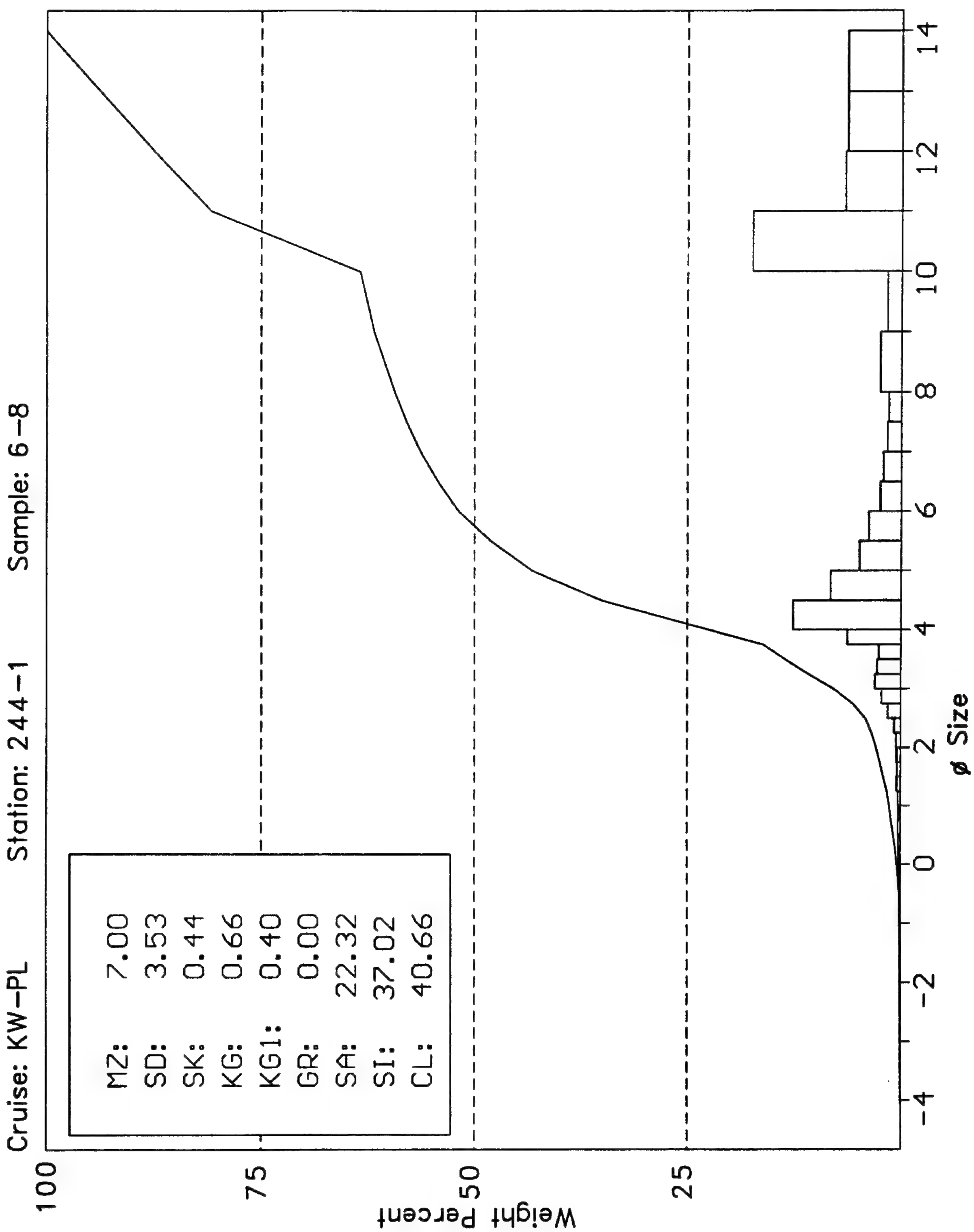
Cruise: KW-PL
Station: 223
Sample: 30-32cm
MZ: 6.87
SD: 3.82
SK: 0.43
KG: 0.70
KG1: 0.41
GR: 0.00
SA: 27.06
SI: 34.33
CL: 38.61
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14


Cruise: KW-PL
Station: 244-1
Sample: 0-2cm
MZ: 7.54
SD: 3.54
SK: 0.36
KG: 0.58
KG1: 0.37
GR: 0.00
SA: 15.00
SI: 40.96
CL: 44.04
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

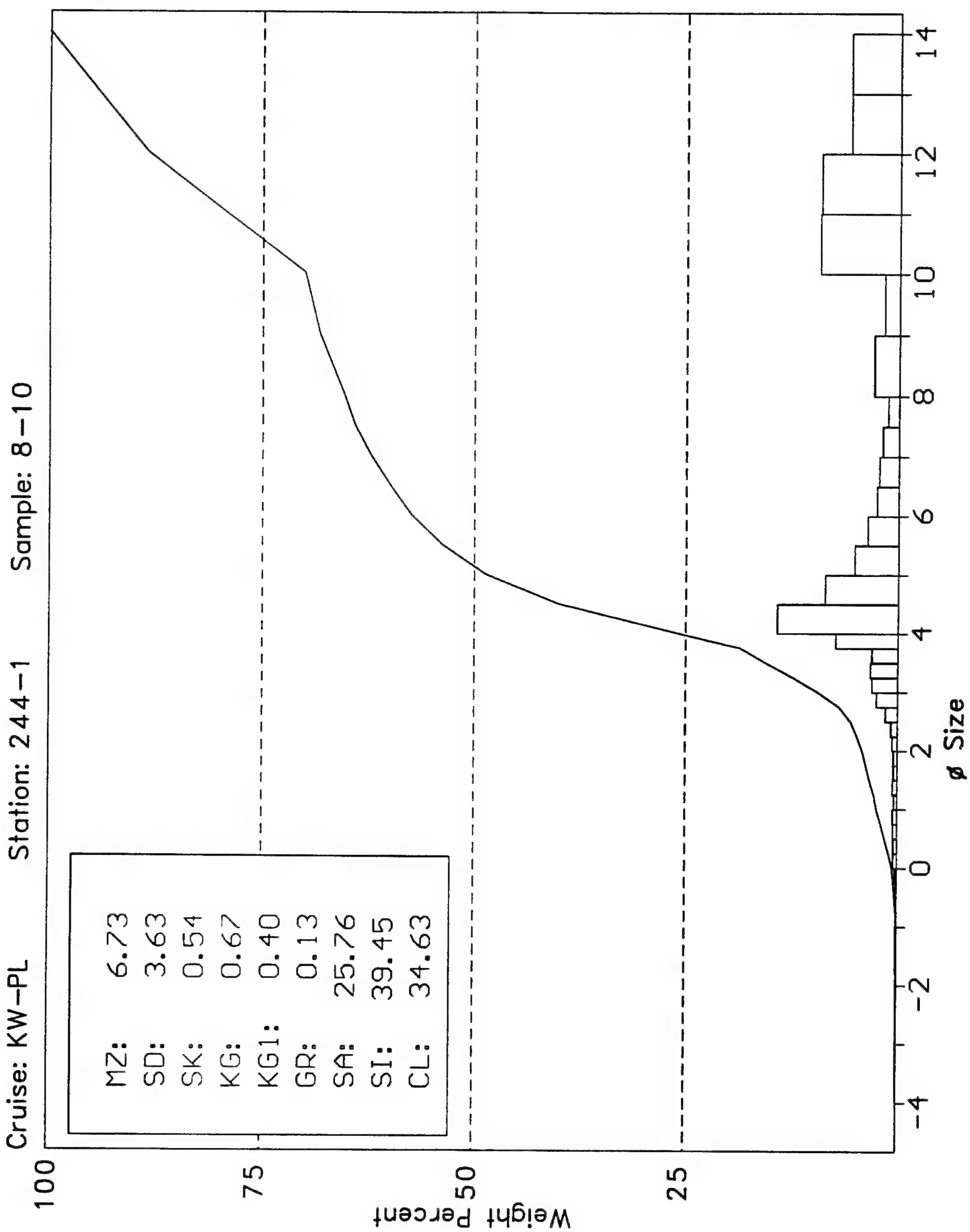

Cruise: KW-PL
Station: 244-1
Sample: 2-4
MZ: 6.21
SD: 3.47
SK: 0.58
KG: 0.96
KG1: 0.49
GR: 0.00
SA: 33.44
SI: 40.89
CL: 25.67
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size



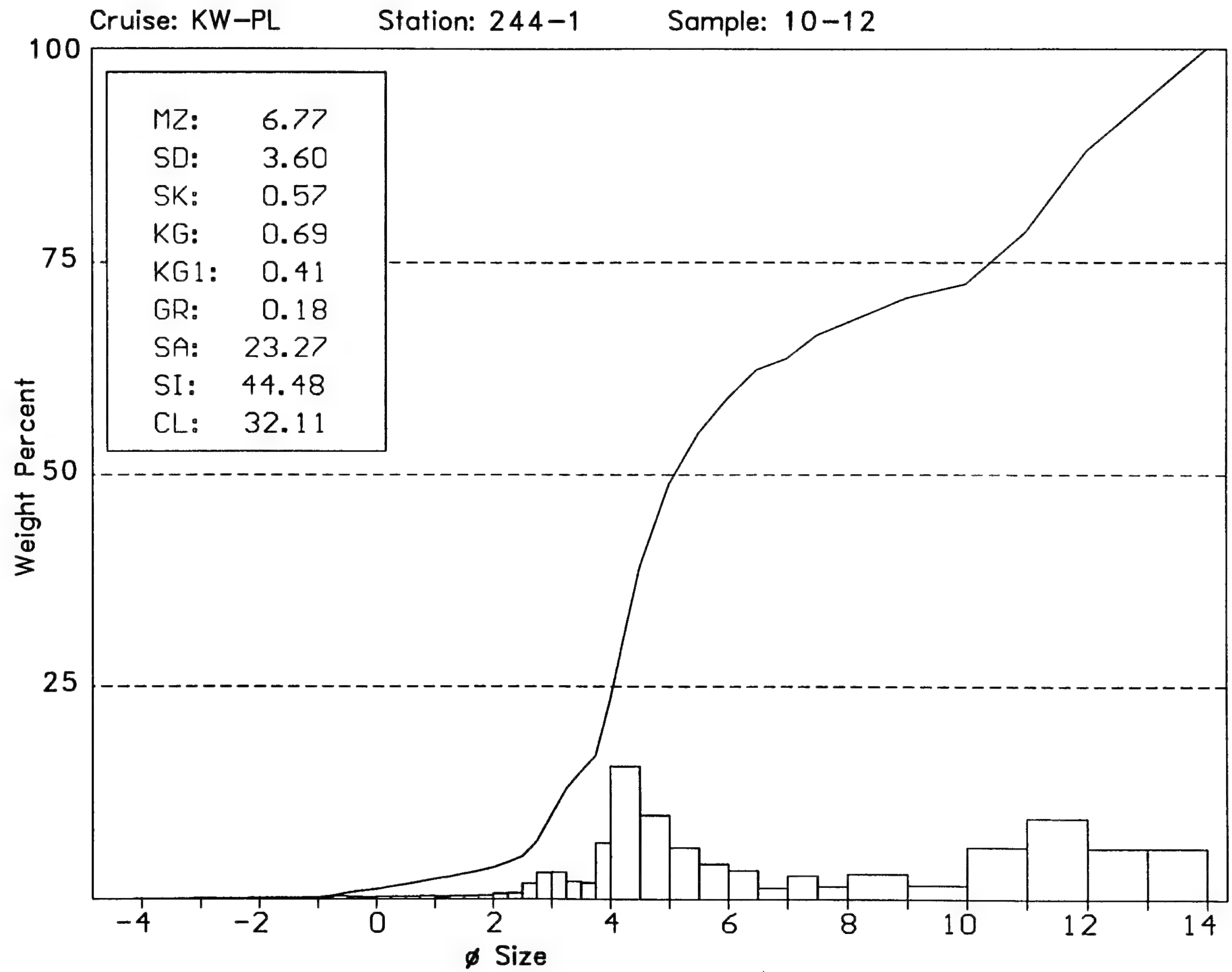
Cruise: KW-PL
Station: 244-1
Sample: 4-6
MZ: 6.53
SD: 3.80
SK: 0.54
KG: 0.74
KG1: 0.43
GR: 0.00
SA: 28.61
SI: 41.19
CL: 30.20
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size



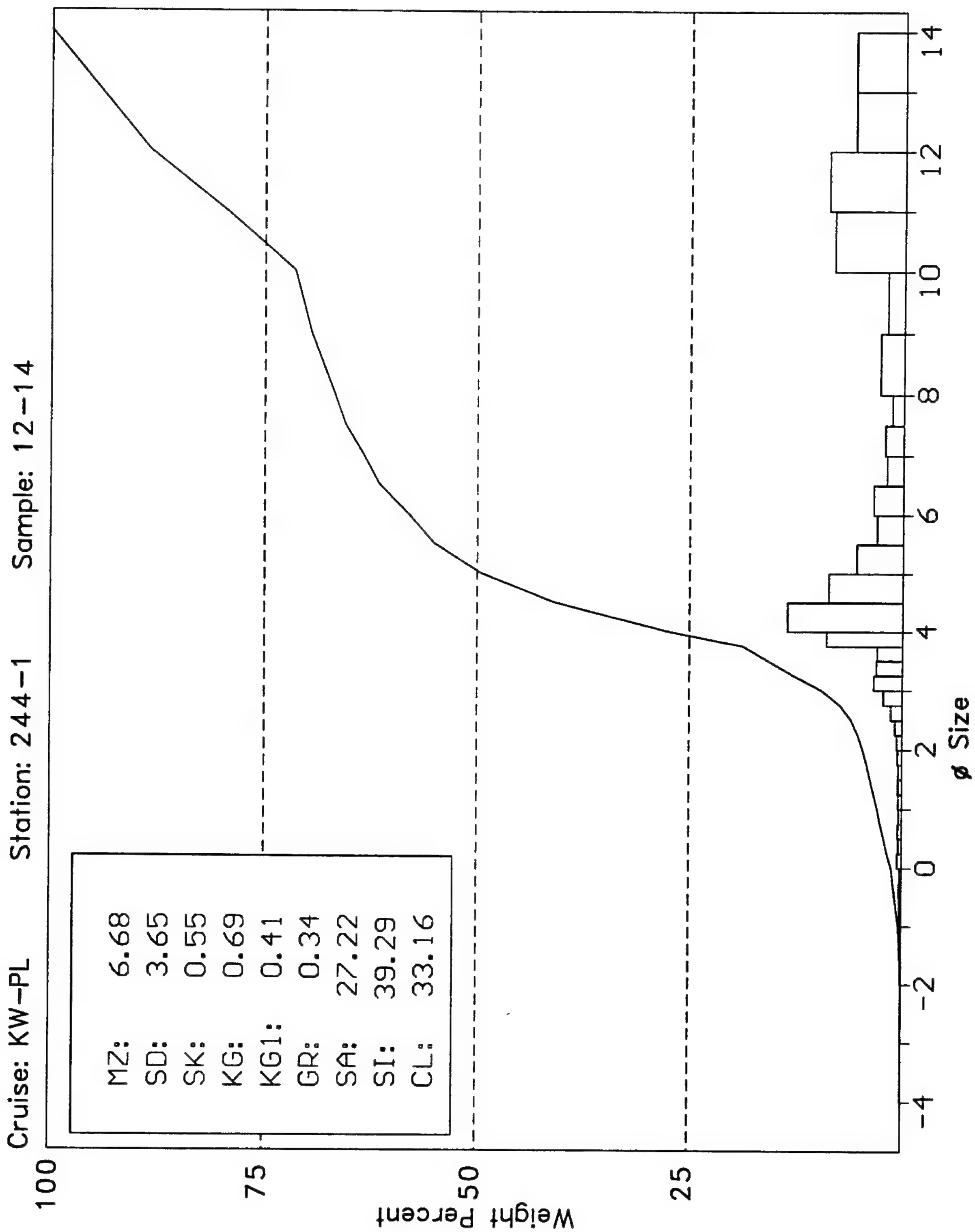
Cruise: KW-PL
Station: 244-1
Sample: 6-8
MZ: 7.00
SD: 3.53
SK: 0.44
KG: 0.66
KG1: 0.40
GR: 0.00
SA: 22.32
SI: 37.02
CL: 40.66
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14



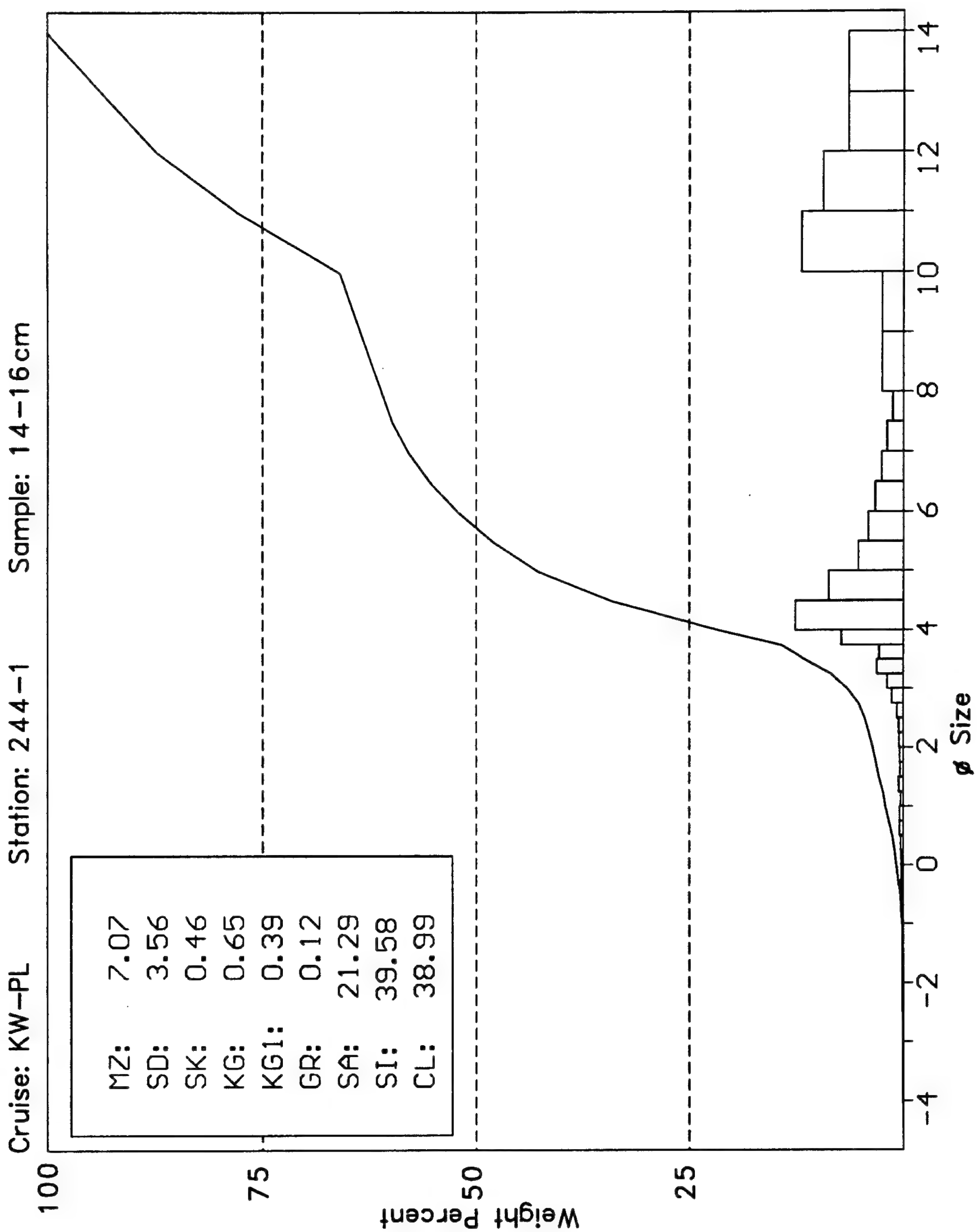
Cruise: KW-PL
Station: 244-1
Sample: 8-10
MZ: 6.73
SD: 3.63
SK: 0.54
KG: 0.67
KG1: 0.40
GR: 0.13
SA: 25.76
SI: 39.45
CL: 34.63
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14



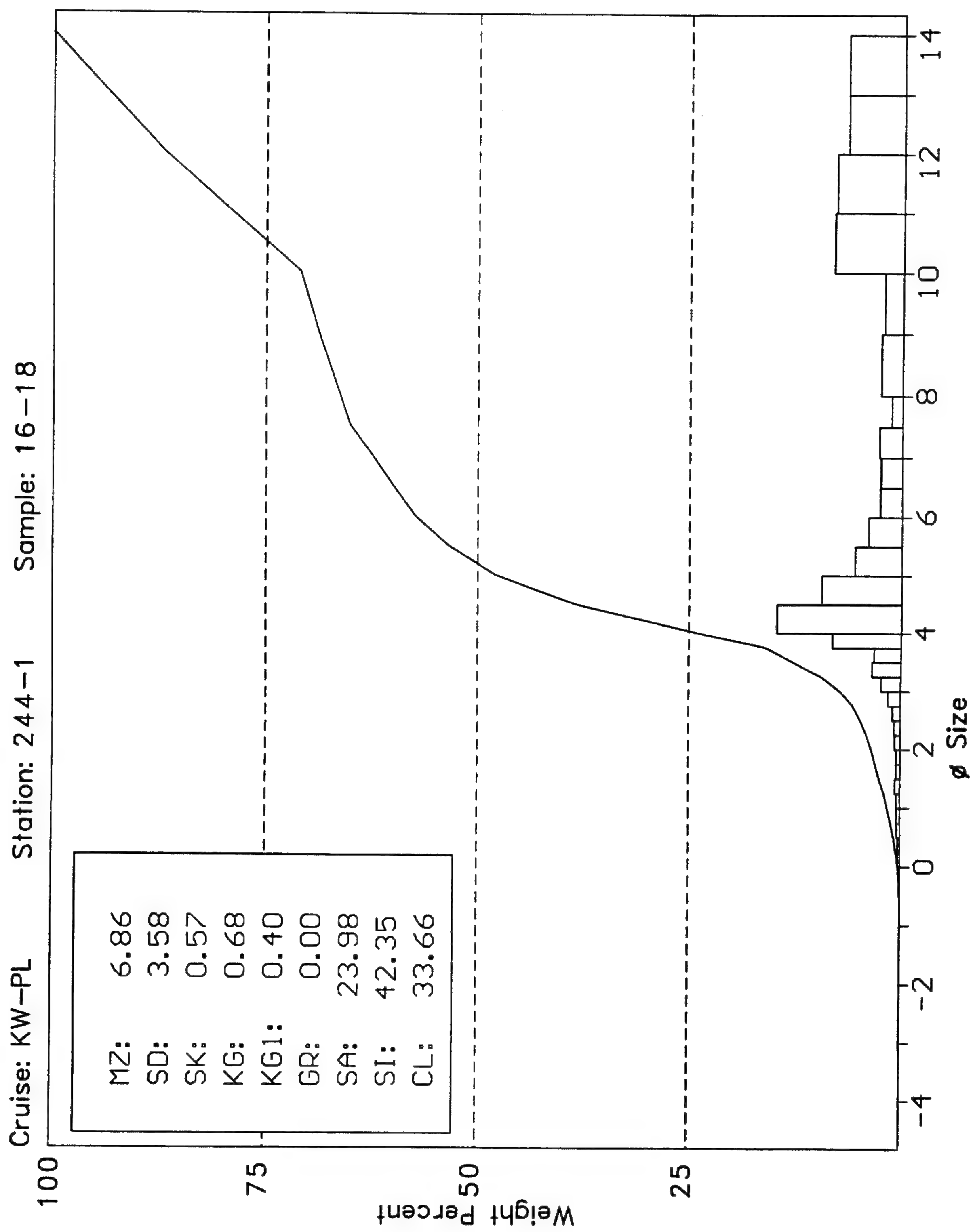
Cruise: KW–PL
Station: 244–1
Sample: 10–12
MZ: 6.77
SD: 3.60
SK: 0.57
KG: 0.69
KG1: 0.41
GR: 0.18
SA: 23.27
SI: 44.48
CL: 32.11
100
75
50
25
Weight Percent
–4
–2
0
2
4
6
8
10
12
14
ø Size



Cruise: KW-PL
Station: 244-1
Sample: 12-14
MZ: 6.68
SD: 3.65
SK: 0.55
KG: 0.69
KG1: 0.41
GR: 0.34
SA: 27.22
SI: 39.29
CL: 33.16
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

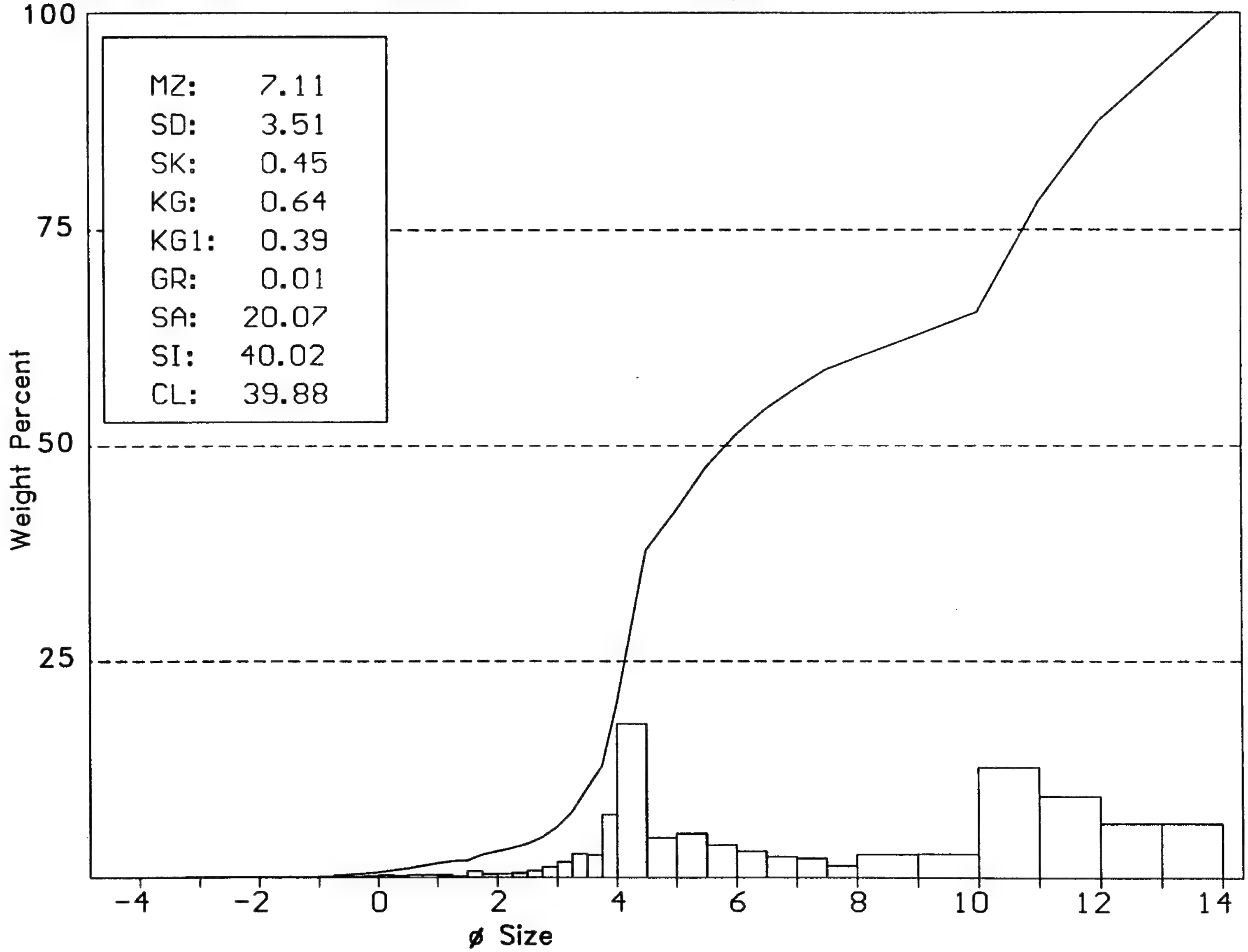


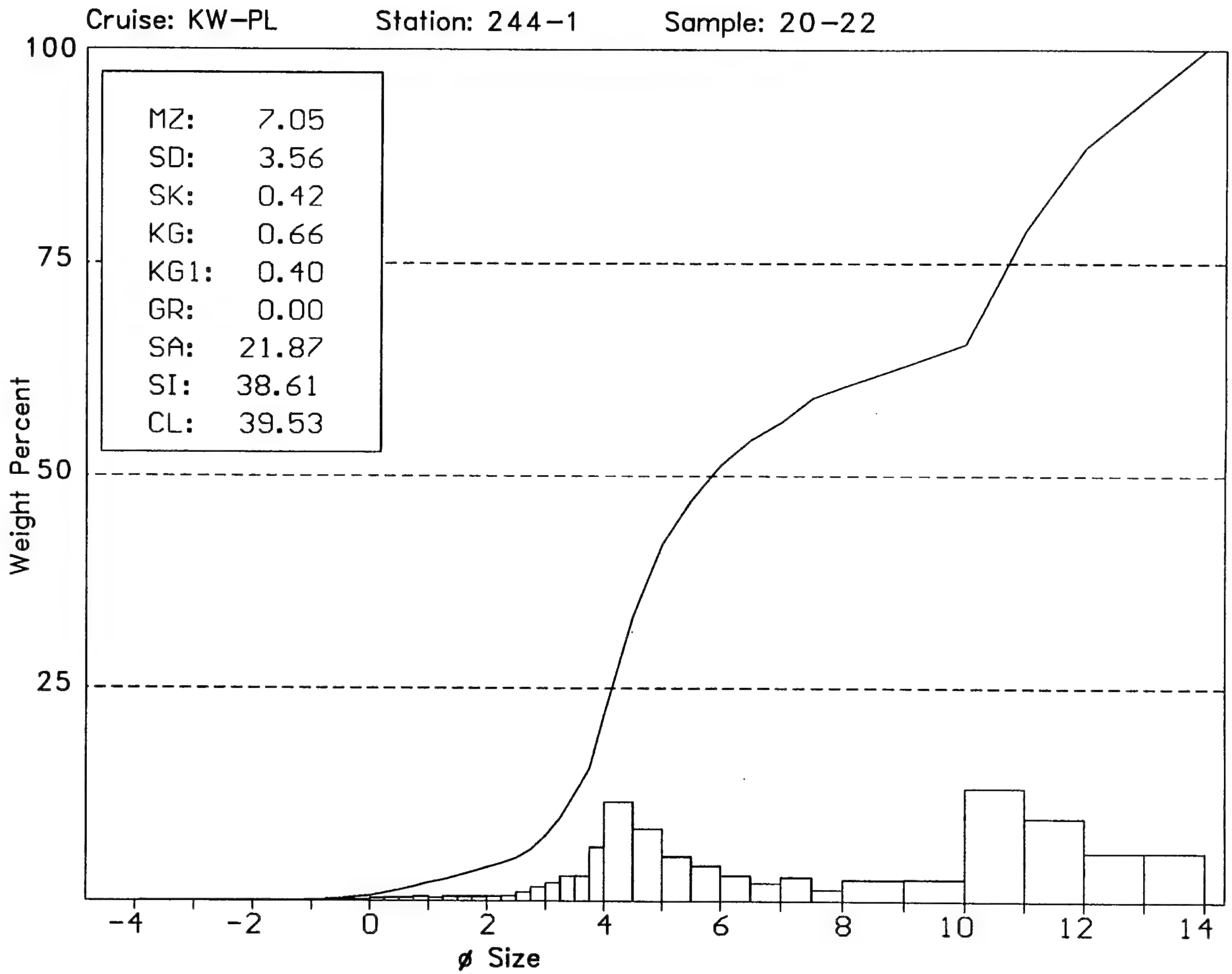
Cruise: KW–PL
Station: 244–1
Sample: 14–16cm
MZ: 7.07
SD: 3.56
SK: 0.46
KG: 0.65
KG1: 0.39
GR: 0.12
SA: 21.29
SI: 39.58
CL: 38.99
100
75
50
25
Weight Percent
–4
–2
0
2
4
6
8
10
12
14
ø Size

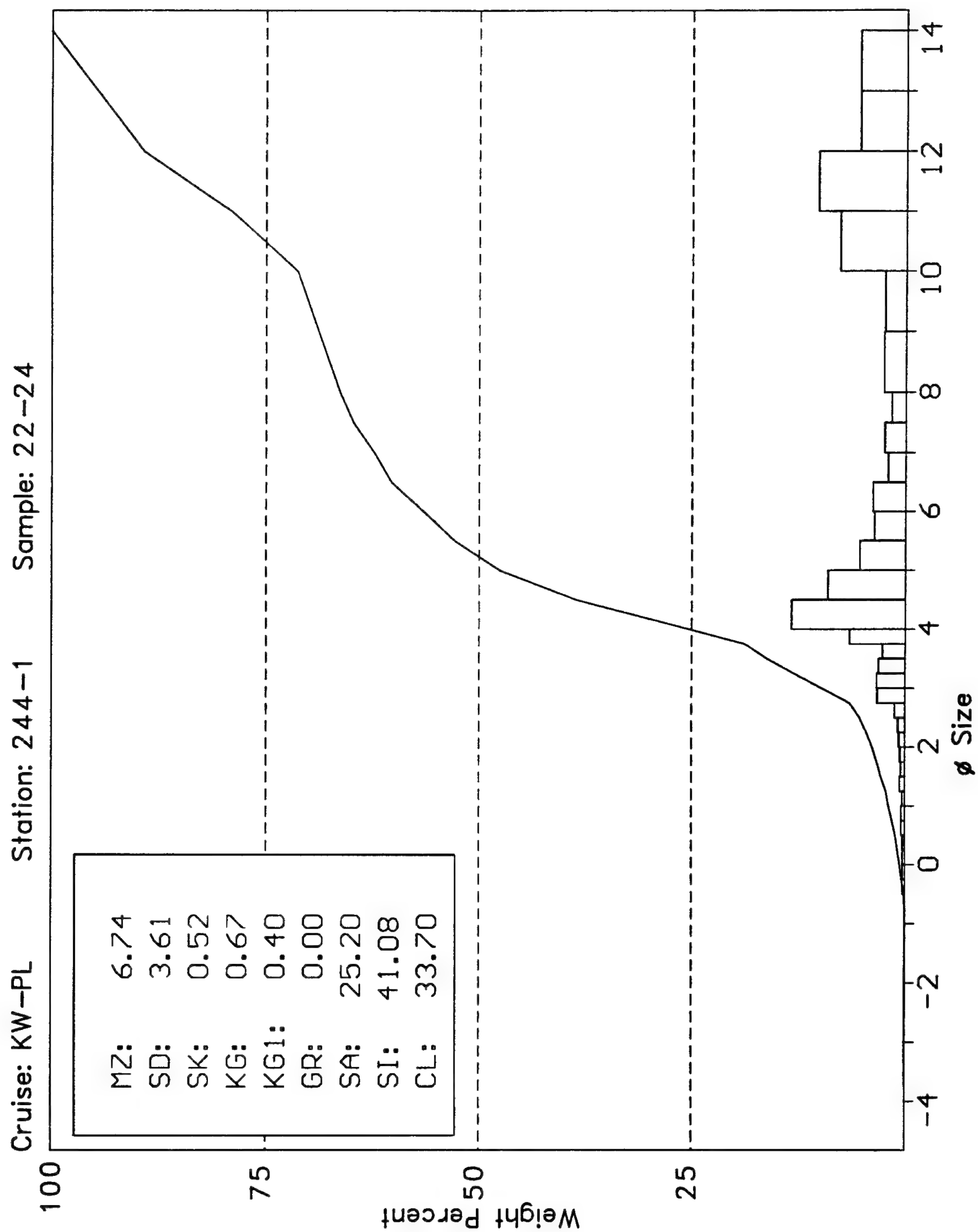


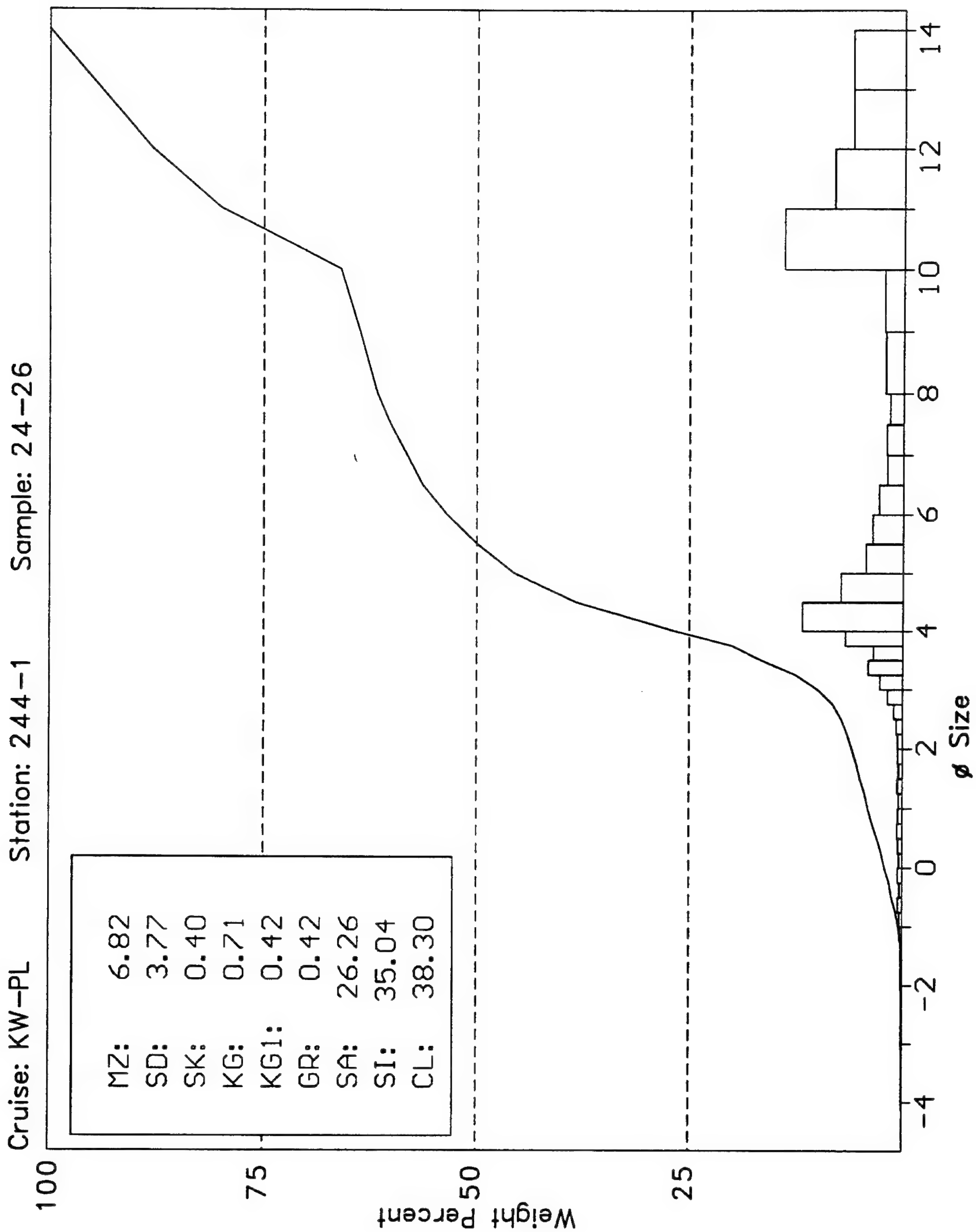
Cruise: KW-PL
Station: 244-1
Sample: 16-18
MZ: 6.86
SD: 3.58
SK: 0.57
KG: 0.68
KG1: 0.40
GR: 0.00
SA: 23.98
SI: 42.35
CL: 33.66
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

Cruise: KW-PL Station: 244-1 Sample: 18-20

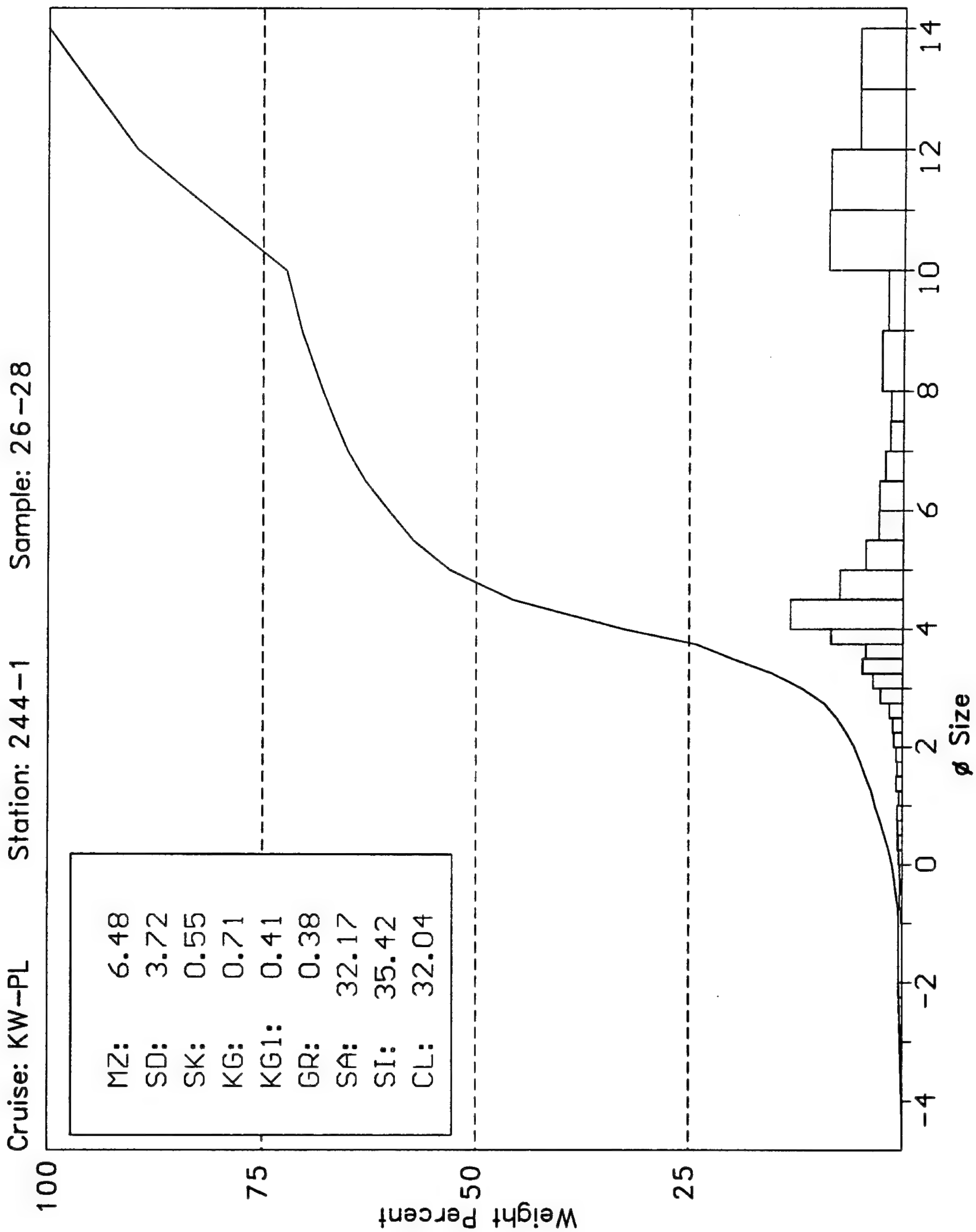


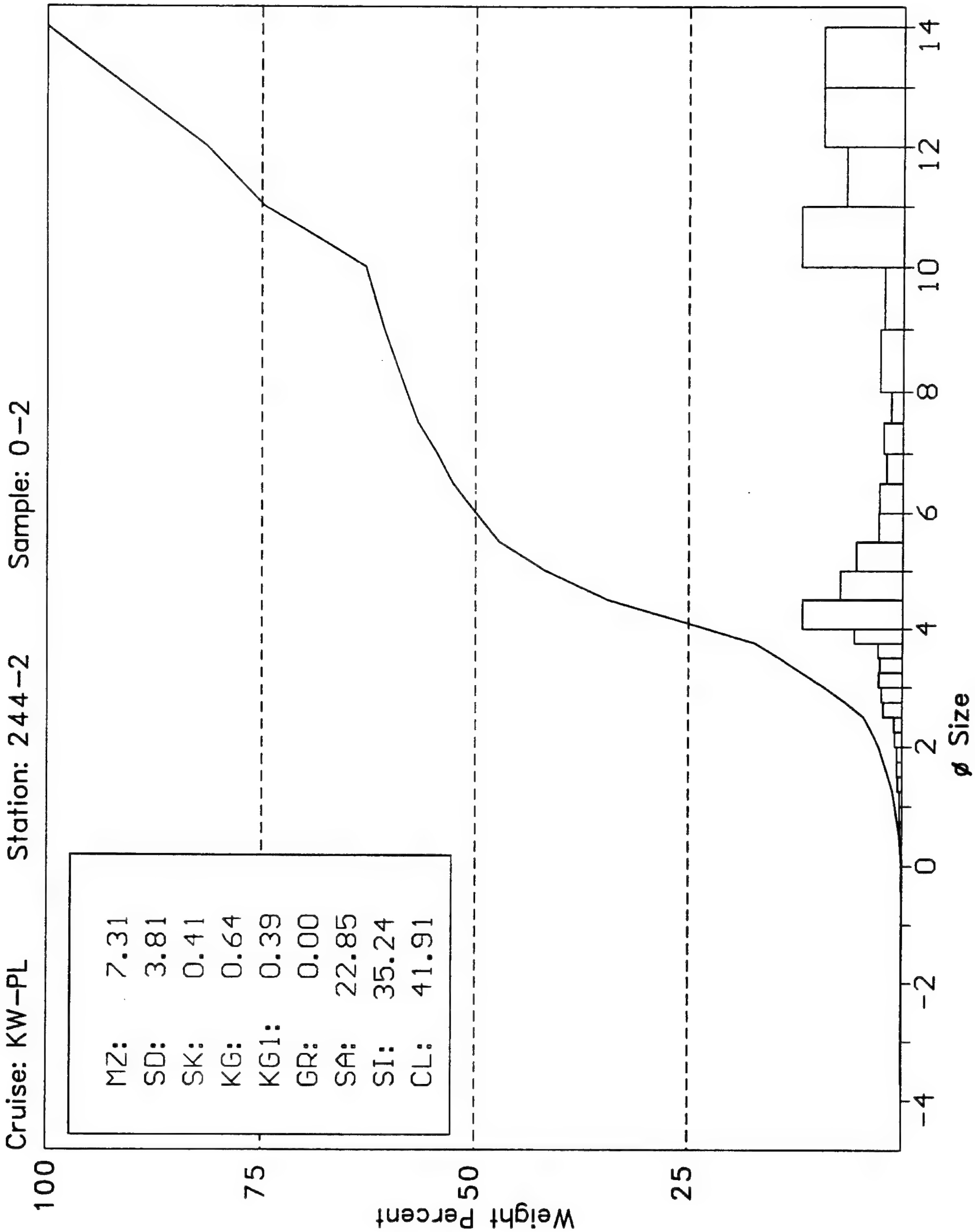

Cruise: KW-PL
Station: 244-1
Sample: 20-22
MZ: 7.05
SD: 3.56
SK: 0.42
KG: 0.66
KG1: 0.40
GR: 0.00
SA: 21.87
SI: 38.61
CL: 39.53
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

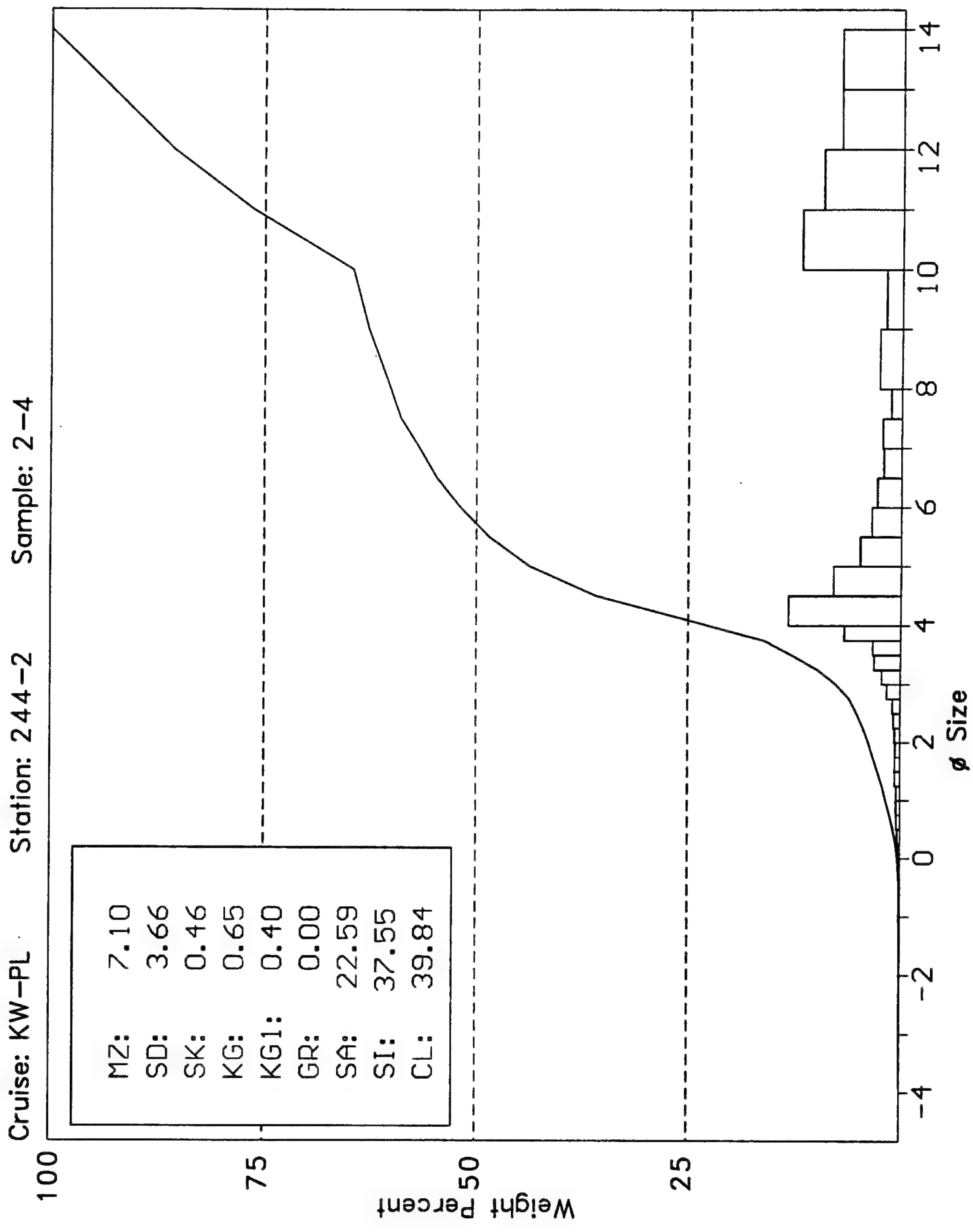

Cruise: KW-PL
Station: 244-1
Sample: 22-24
MZ: 6.74
SD: 3.61
SK: 0.52
KG: 0.67
KG1: 0.40
GR: 0.00
SA: 25.20
SI: 41.08
CL: 33.70
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

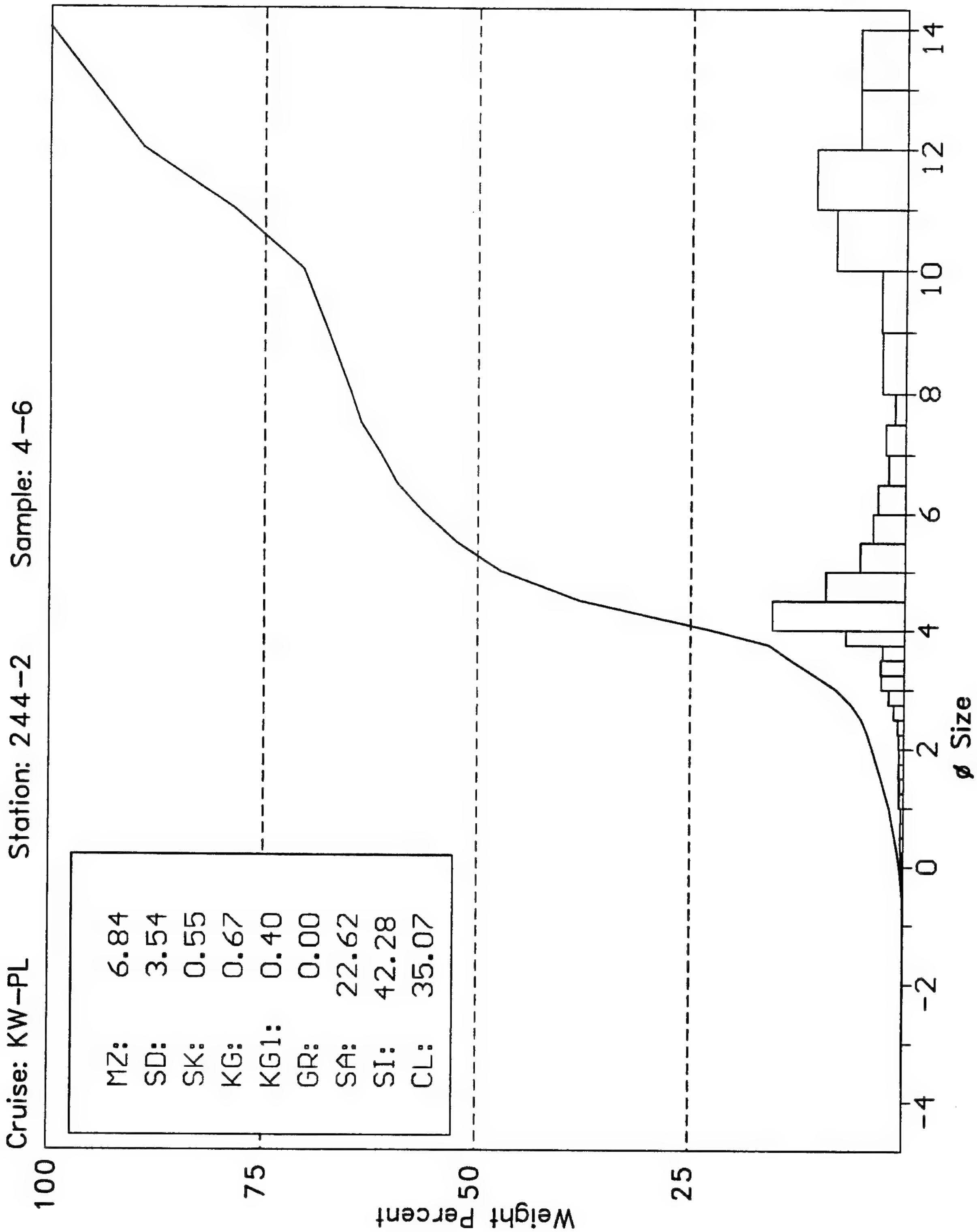


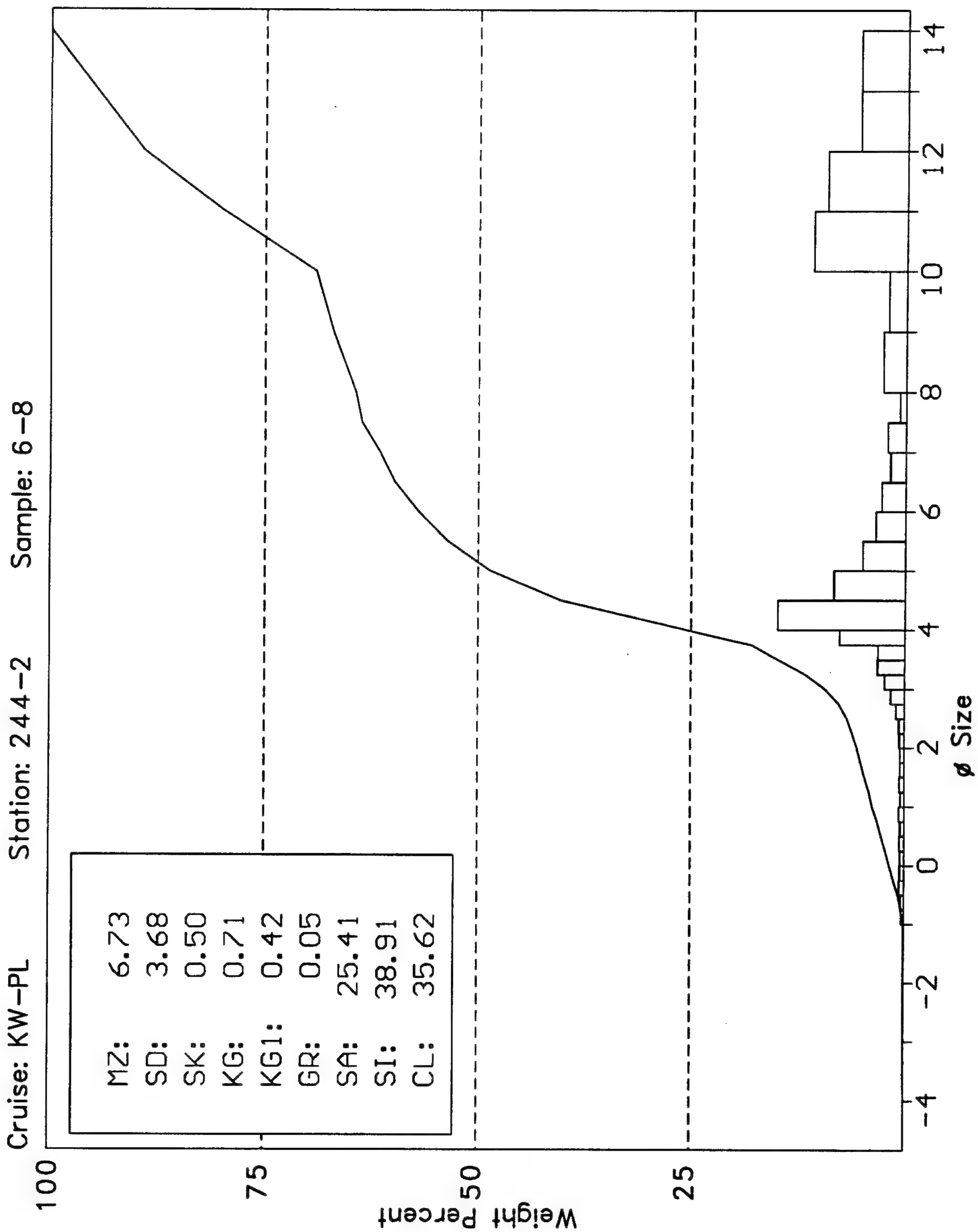
Cruise: KW-PL
Station: 244-1
Sample: 24-26
MZ: 6.82
SD: 3.77
SK: 0.40
KG: 0.71
KG1: 0.42
GR: 0.42
SA: 26.26
SI: 35.04
CL: 38.30
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

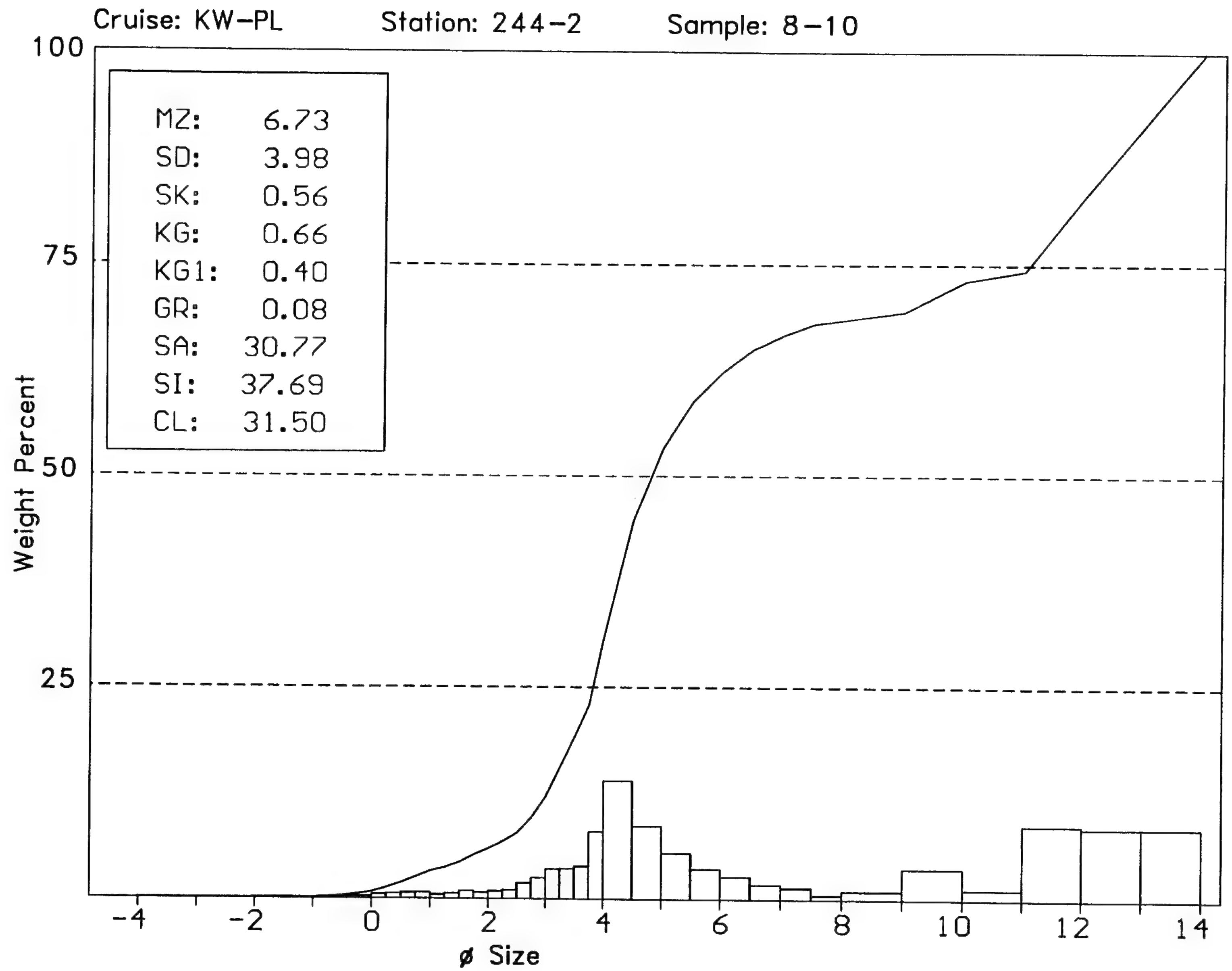

Cruise: KW-PL
Station: 244-1
Sample: 26-28
MZ: 6.48
SD: 3.72
SK: 0.55
KG: 0.71
KG1: 0.41
GR: 0.38
SA: 32.17
SI: 35.42
CL: 32.04
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14


Cruise: KW-PL
Station: 244-2
Sample: 0-2
MZ: 7.31
SD: 3.81
SK: 0.41
KG: 0.64
KG1: 0.39
GR: 0.00
SA: 22.85
SI: 35.24
CL: 41.91
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

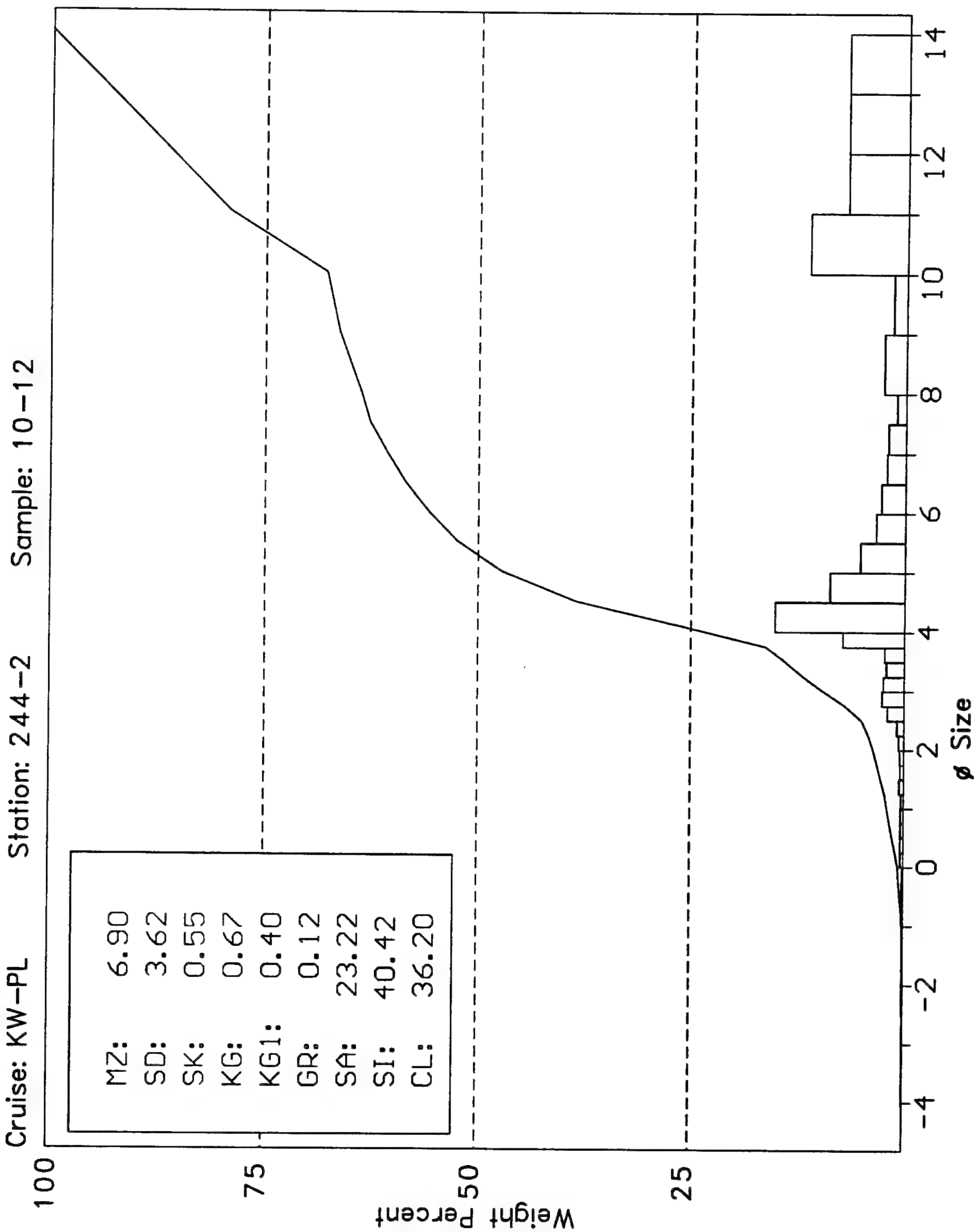

Cruise: KW-PL
Station: 244-2
Sample: 2-4
MZ: 7.10
SD: 3.66
SK: 0.46
KG: 0.65
KG1: 0.40
GR: 0.00
SA: 22.59
SI: 37.55
CL: 39.84
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size


Cruise: KW-PL
Station: 244-2
Sample: 4-6
MZ: 6.84
SD: 3.54
SK: 0.55
KG: 0.67
KG1: 0.40
GR: 0.00
SA: 22.62
SI: 42.28
CL: 35.07
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

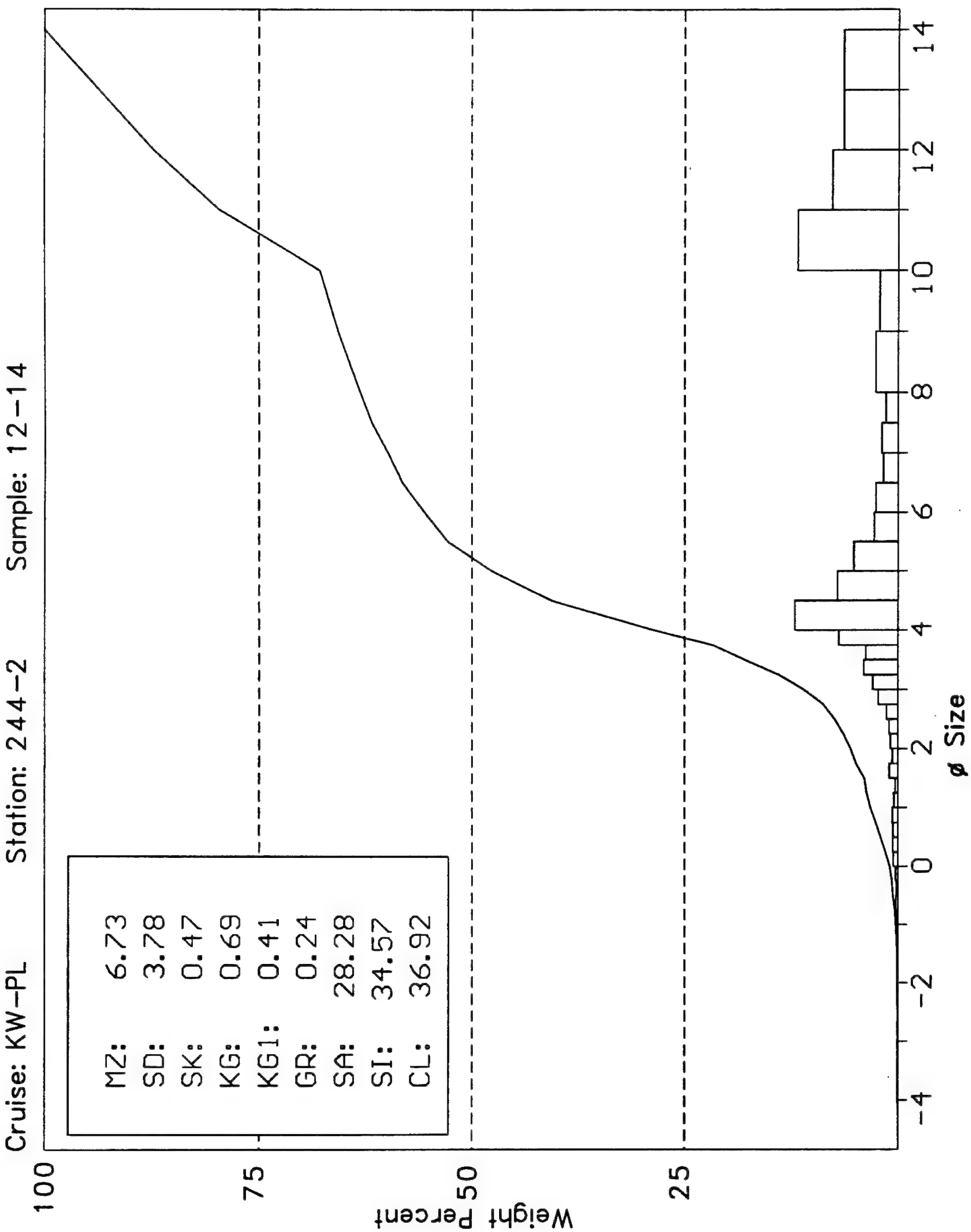

Cruise: KW-PL
Station: 244-2
Sample: 6-8
MZ: 6.73
SD: 3.68
SK: 0.50
KG: 0.71
KG1: 0.42
GR: 0.05
SA: 25.41
SI: 38.91
CL: 35.62
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

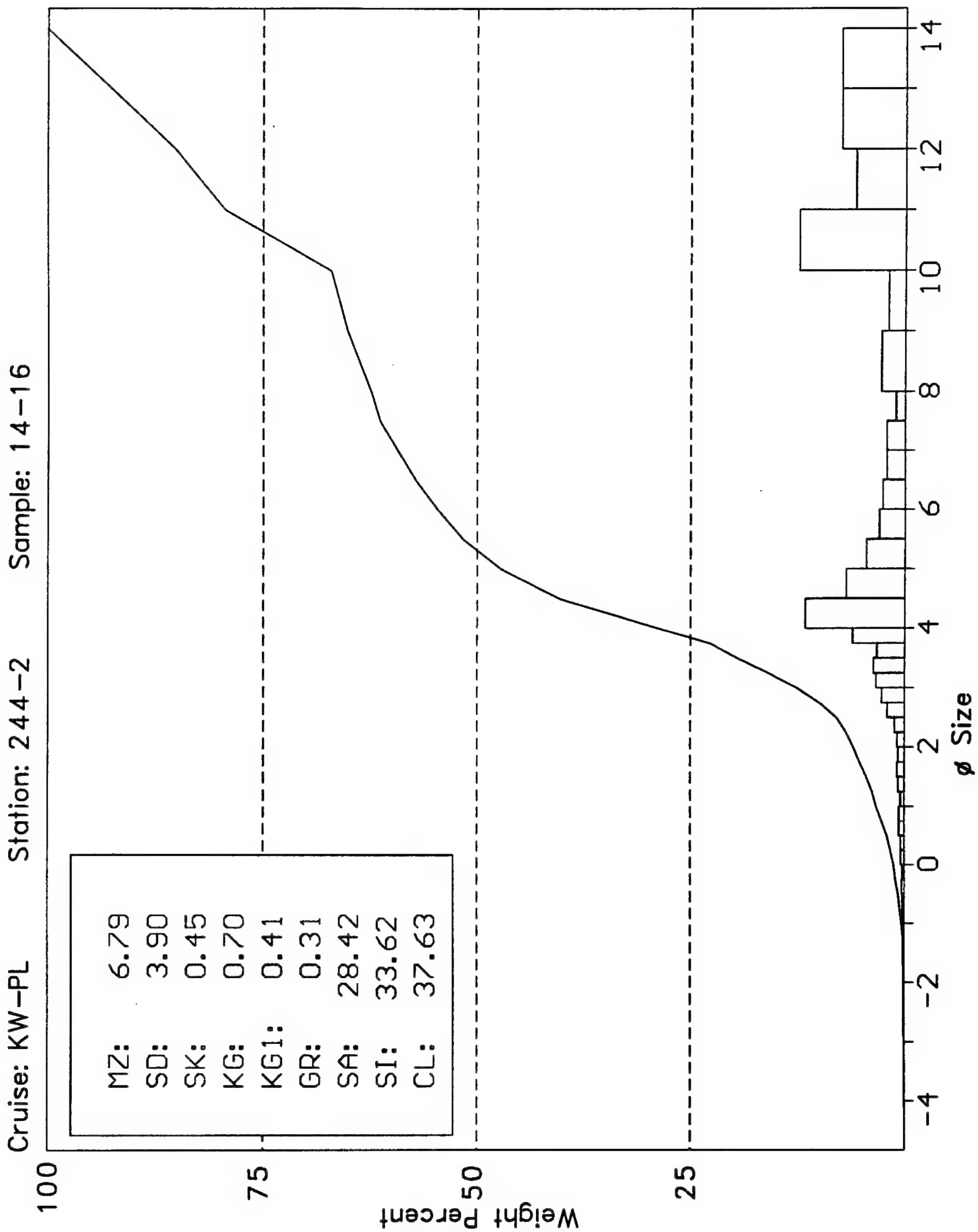


Cruise: KW-PL
Station: 244-2
Sample: 8-10
MZ: 6.73
SD: 3.98
SK: 0.56
KG: 0.66
KG1: 0.40
GR: 0.08
SA: 30.77
SI: 37.69
CL: 31.50
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

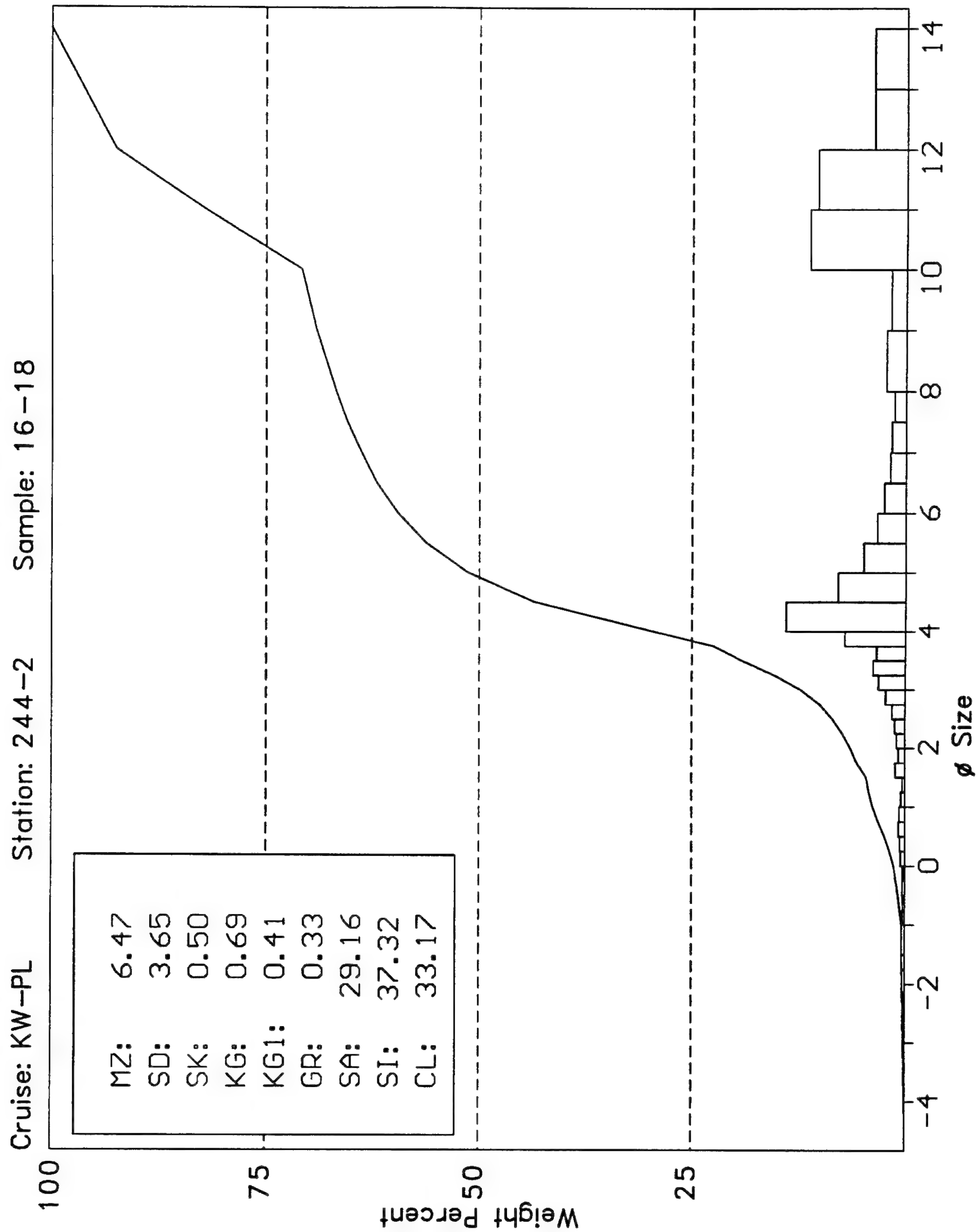


Cruise: KW-PL
Station: 244-2
Sample: 10-12
MZ: 6.90
SD: 3.62
SK: 0.55
KG: 0.67
KG1: 0.40
GR: 0.12
SA: 23.22
SI: 40.42
CL: 36.20
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

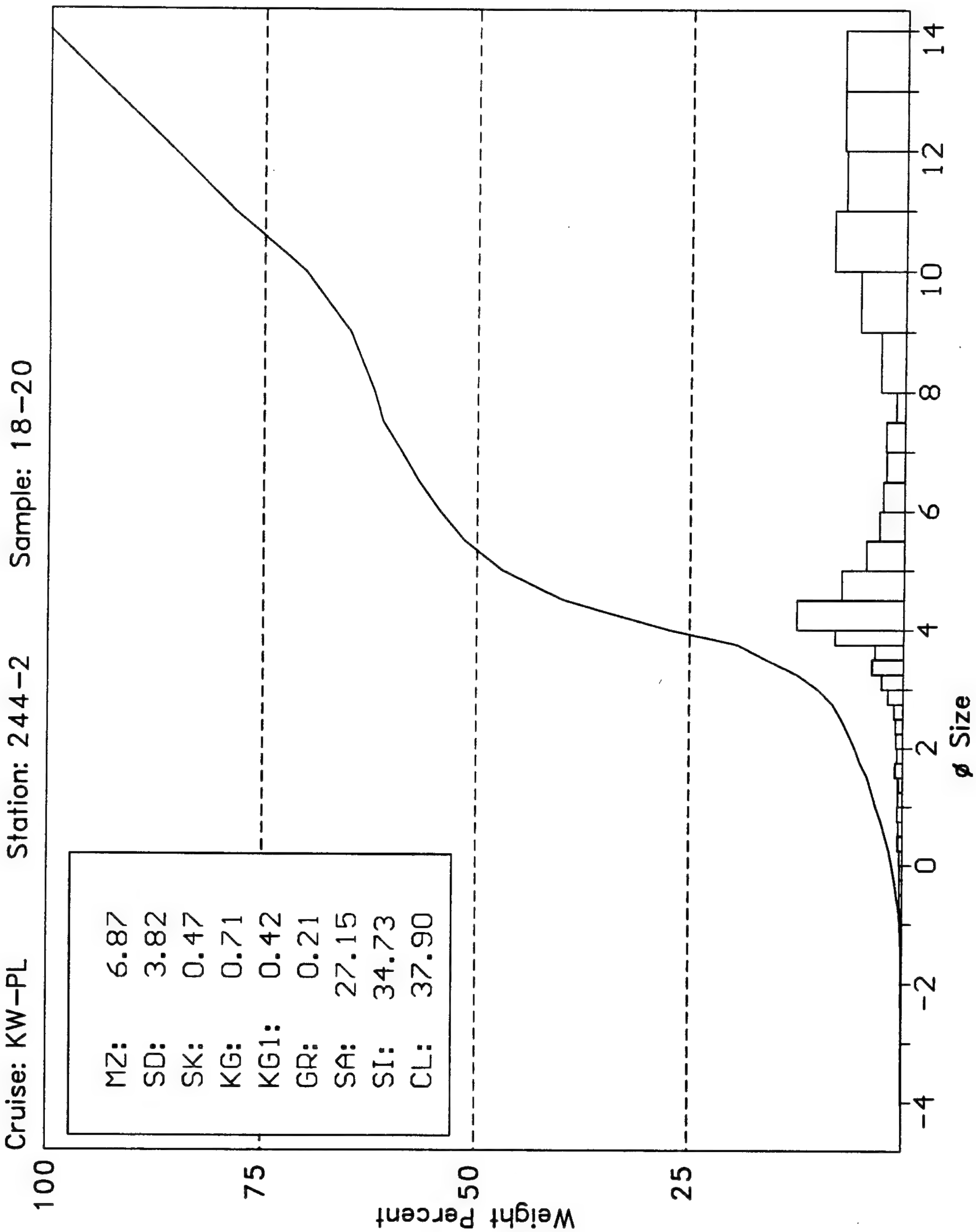

Cruise: KW-PL
Station: 244-2
Sample: 12-14
MZ: 6.73
SD: 3.78
SK: 0.47
KG: 0.69
KG1: 0.41
GR: 0.24
SA: 28.28
SI: 34.57
CL: 36.92
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size



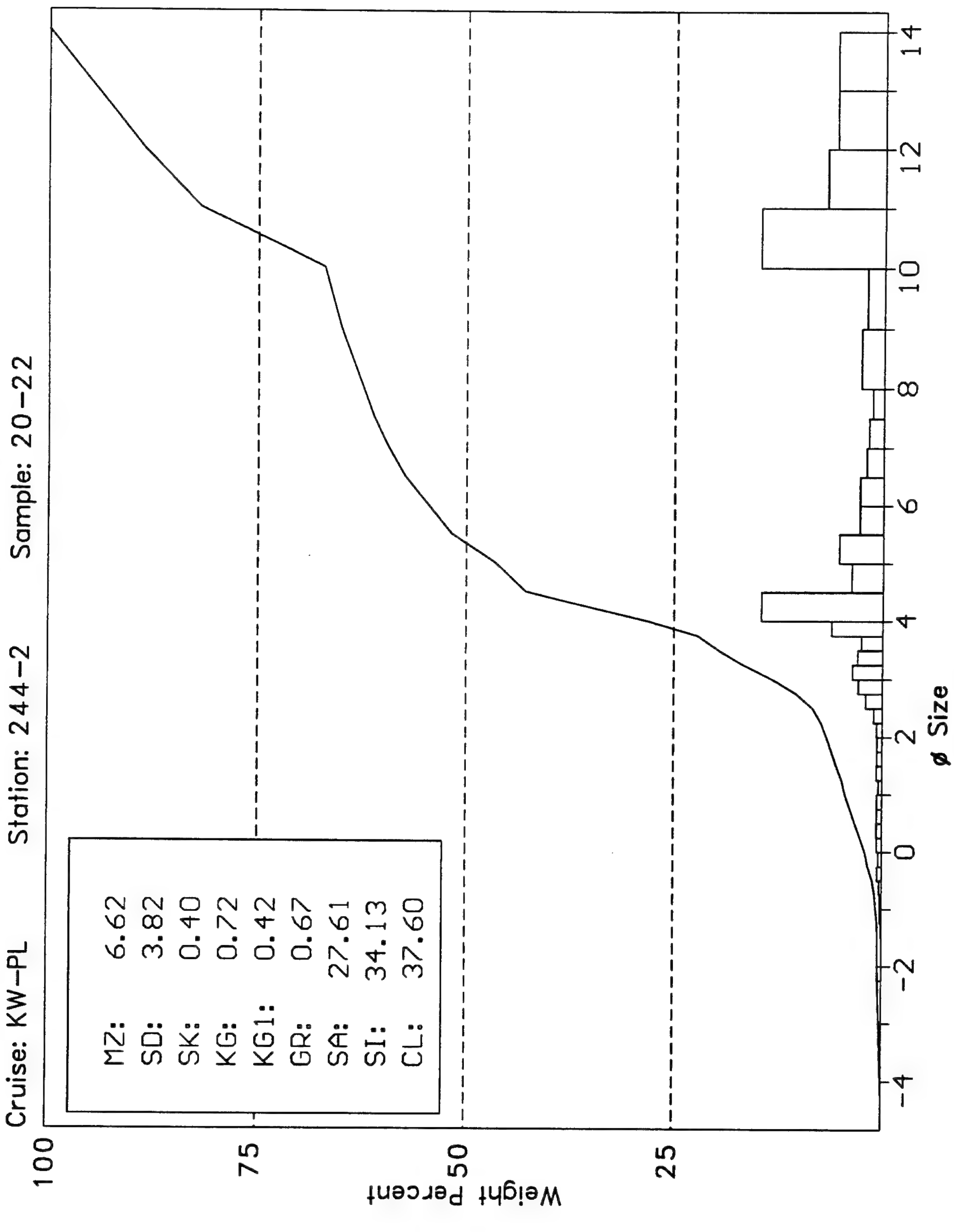
Cruise: KW-PL
Station: 244-2
Sample: 14-16
MZ: 6.79
SD: 3.90
SK: 0.45
KG: 0.70
KG1: 0.41
GR: 0.31
SA: 28.42
SI: 33.62
CL: 37.63
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

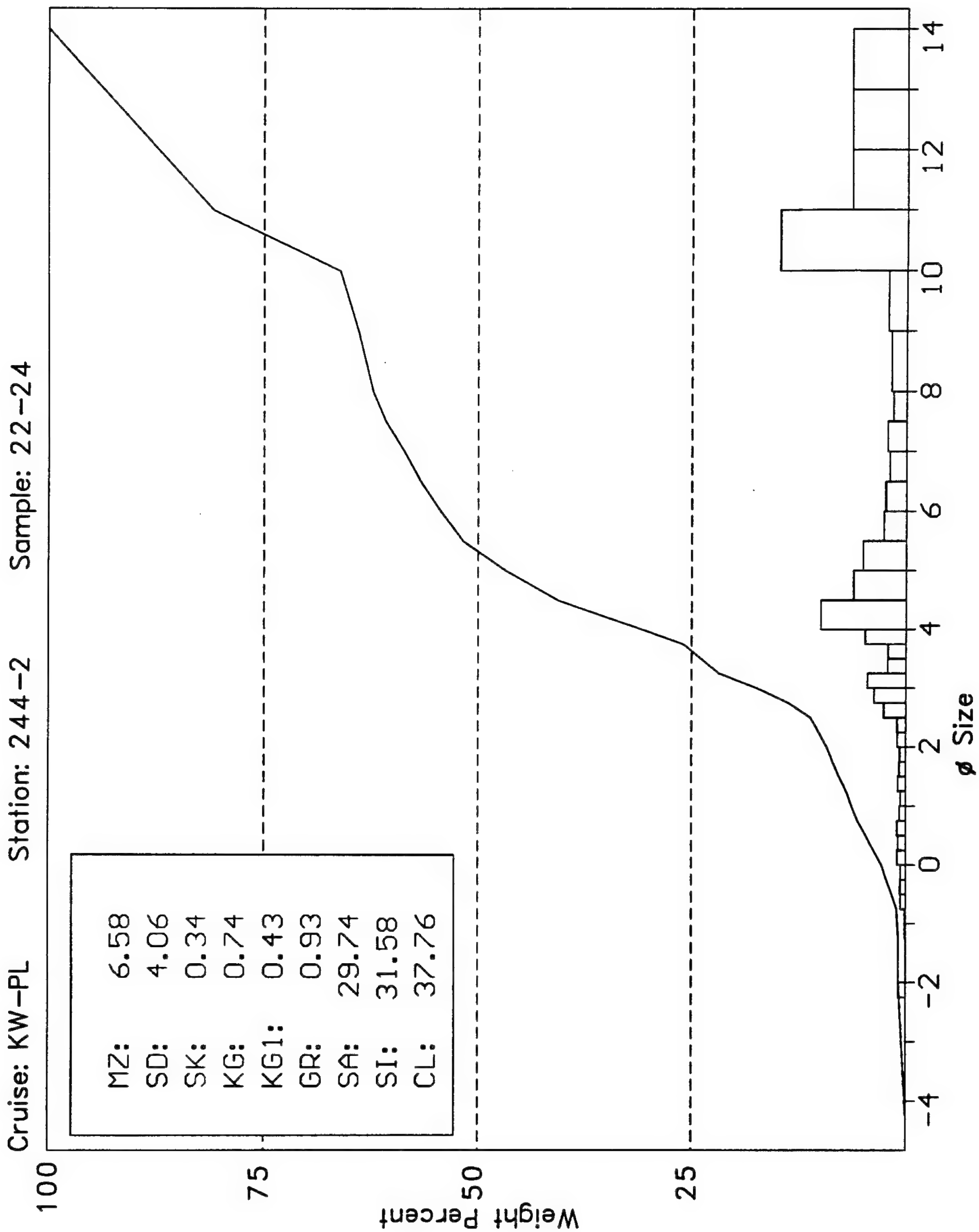


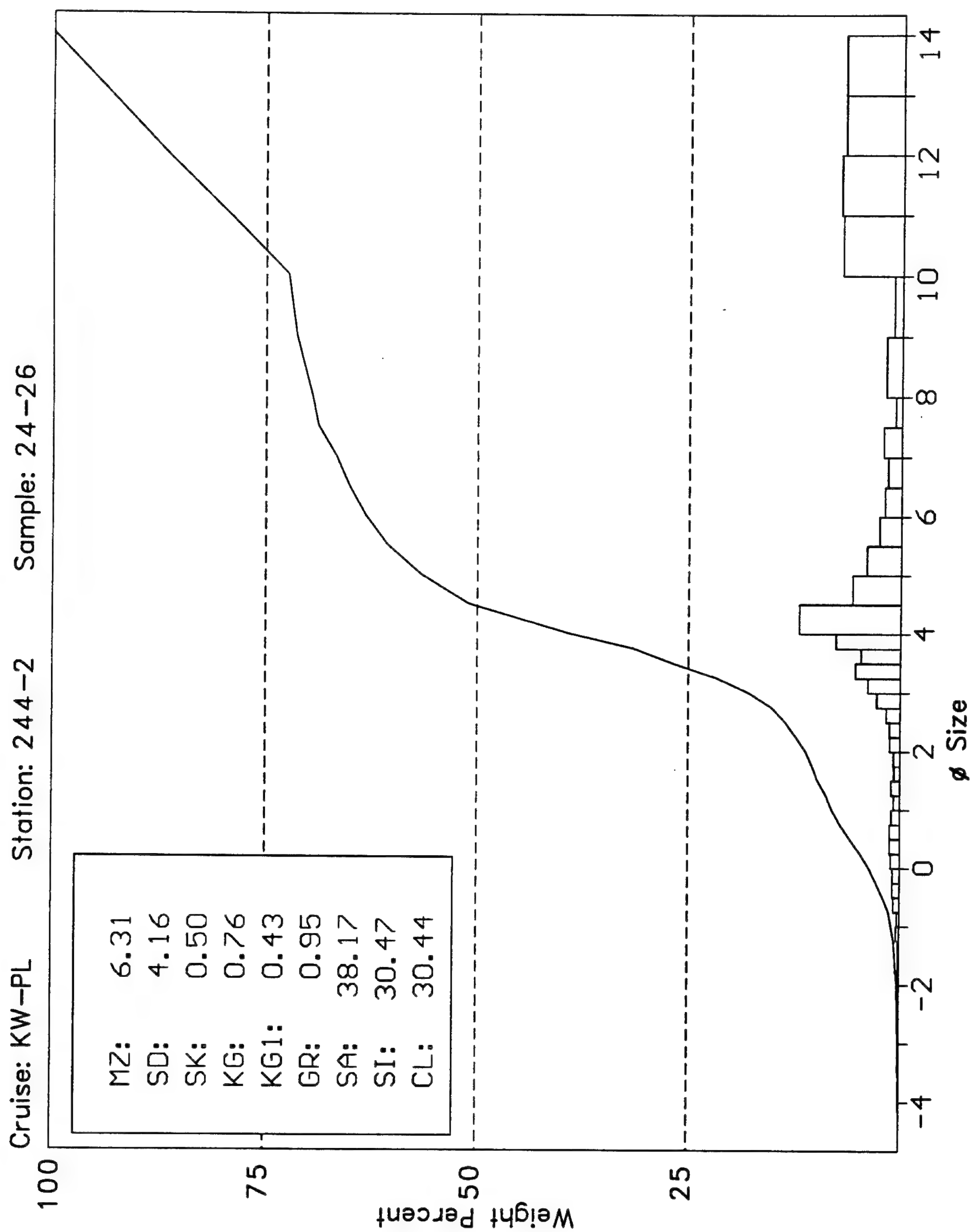
Cruise: KW-PL
Station: 244-2
Sample: 16-18
MZ: 6.47
SD: 3.65
SK: 0.50
KG: 0.69
KG1: 0.41
GR: 0.33
SA: 29.16
SI: 37.32
CL: 33.17
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14



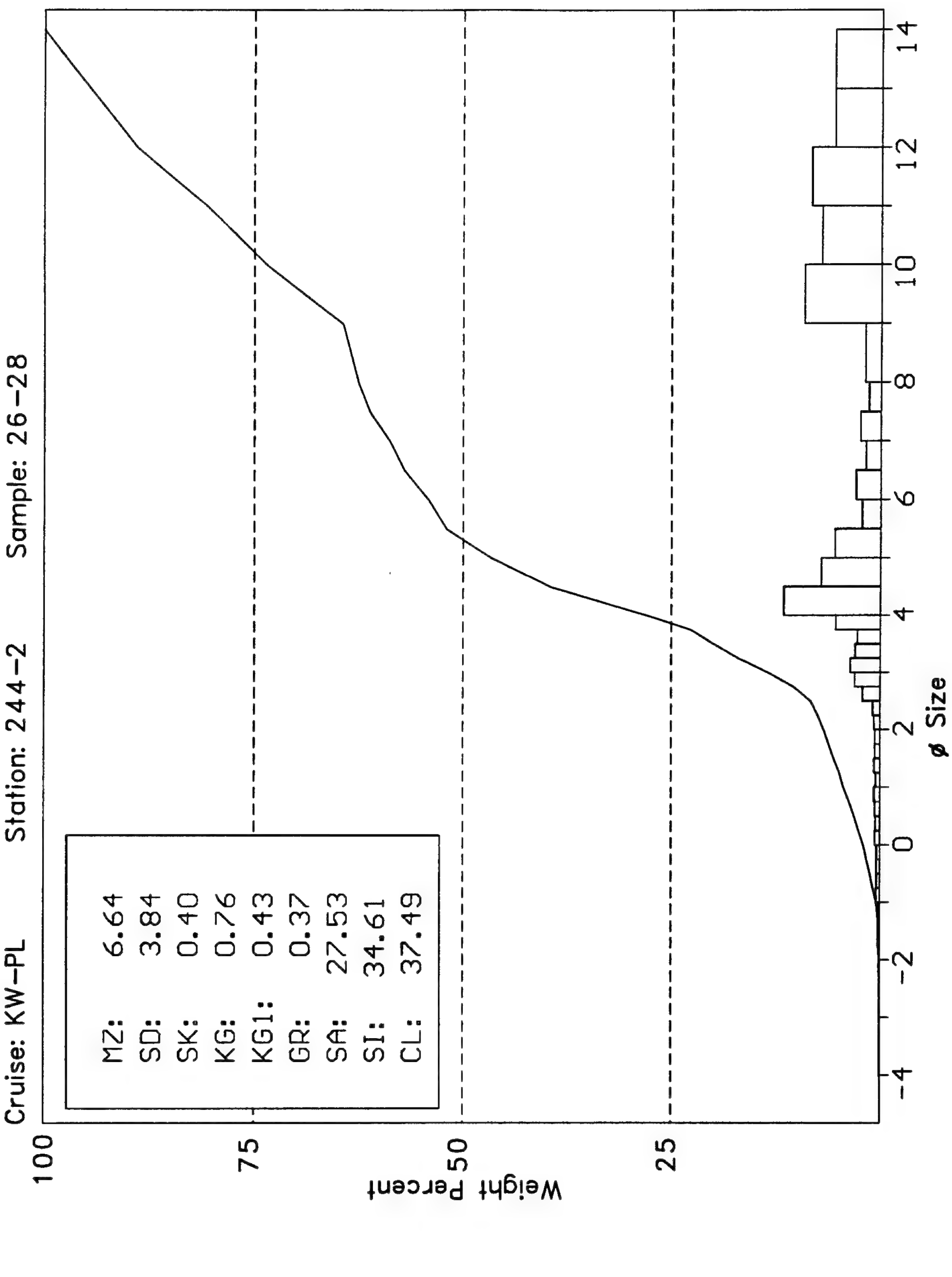
Cruise: KW-PL
Station: 244-2
Sample: 18-20
MZ: 6.87
SD: 3.82
SK: 0.47
KG: 0.71
KG1: 0.42
GR: 0.21
SA: 27.15
SI: 34.73
CL: 37.90
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14


Cruise: KW-PL
Station: 244-2
Sample: 20-22
MZ: 6.62
SD: 3.82
SK: 0.40
KG: 0.72
KG1: 0.42
GR: 0.67
SA: 27.61
SI: 34.13
CL: 37.60
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

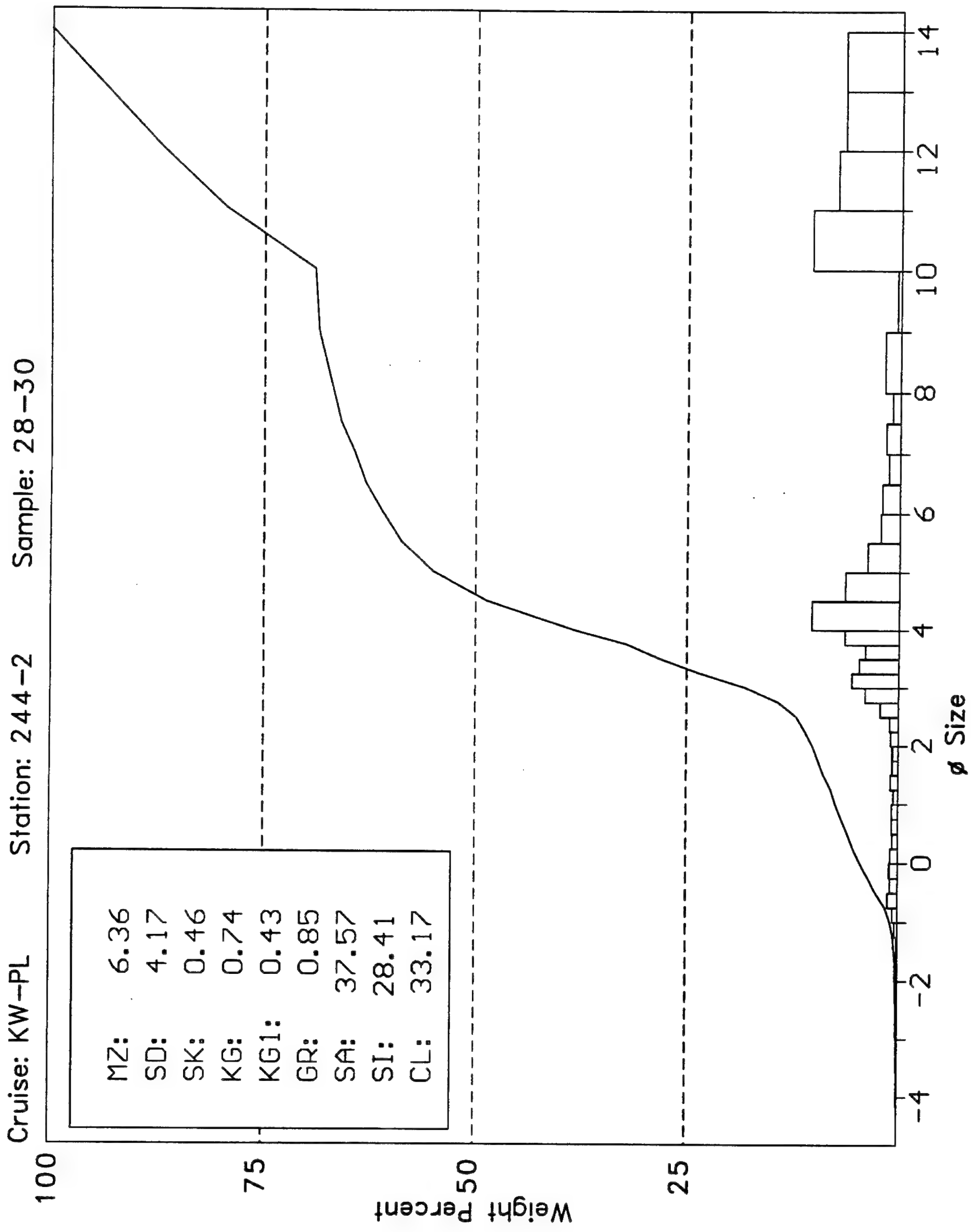

Cruise: KW-PL
Station: 244-2
Sample: 22-24
MZ: 6.58
SD: 4.06
SK: 0.34
KG: 0.74
KG1: 0.43
GR: 0.93
SA: 29.74
SI: 31.58
CL: 37.76
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

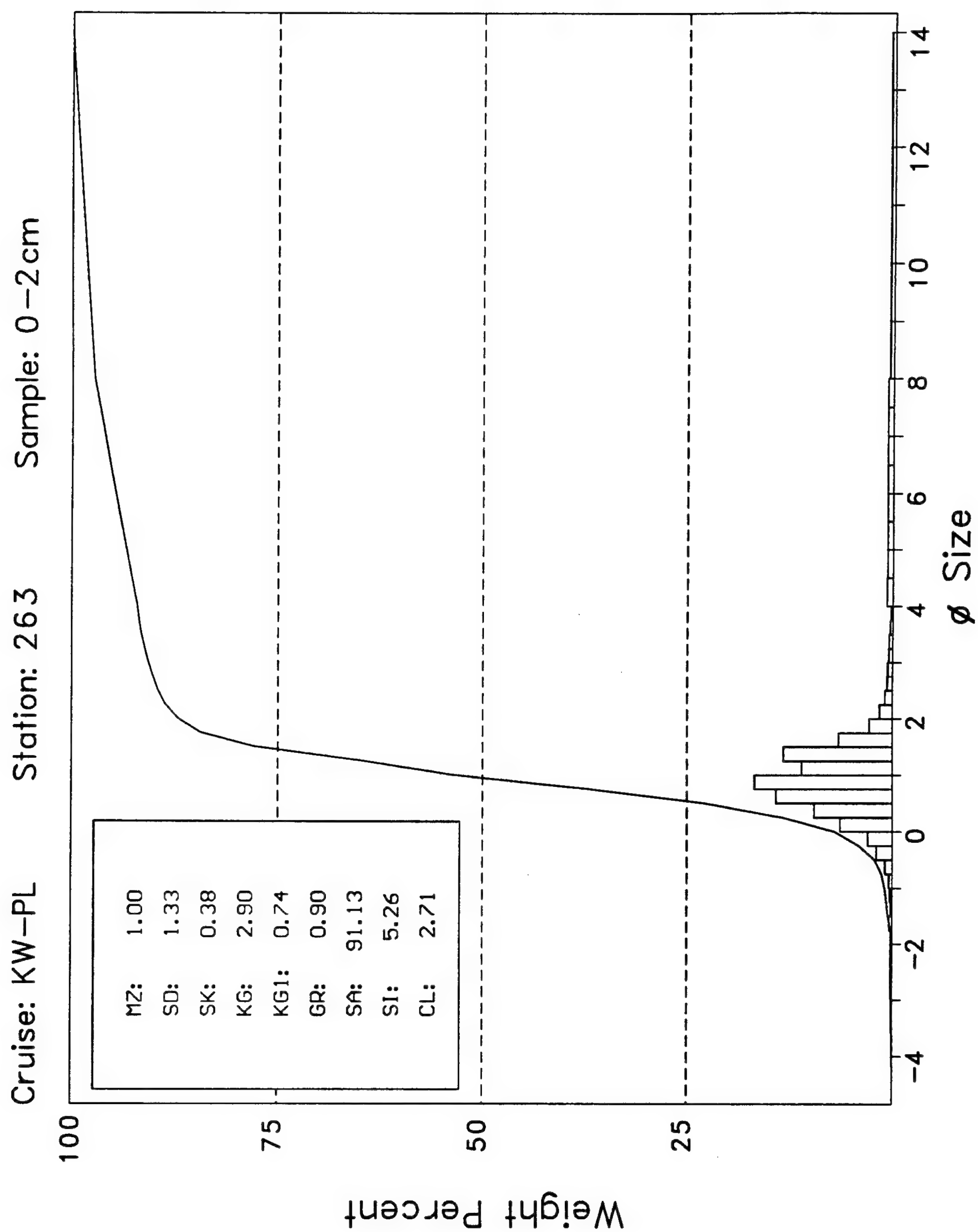


Cruise: KW-PL
Station: 244-2
Sample: 24-26
MZ: 6.31
SD: 4.16
SK: 0.50
KG: 0.76
KG1: 0.43
GR: 0.95
SA: 38.17
SI: 30.47
CL: 30.44
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

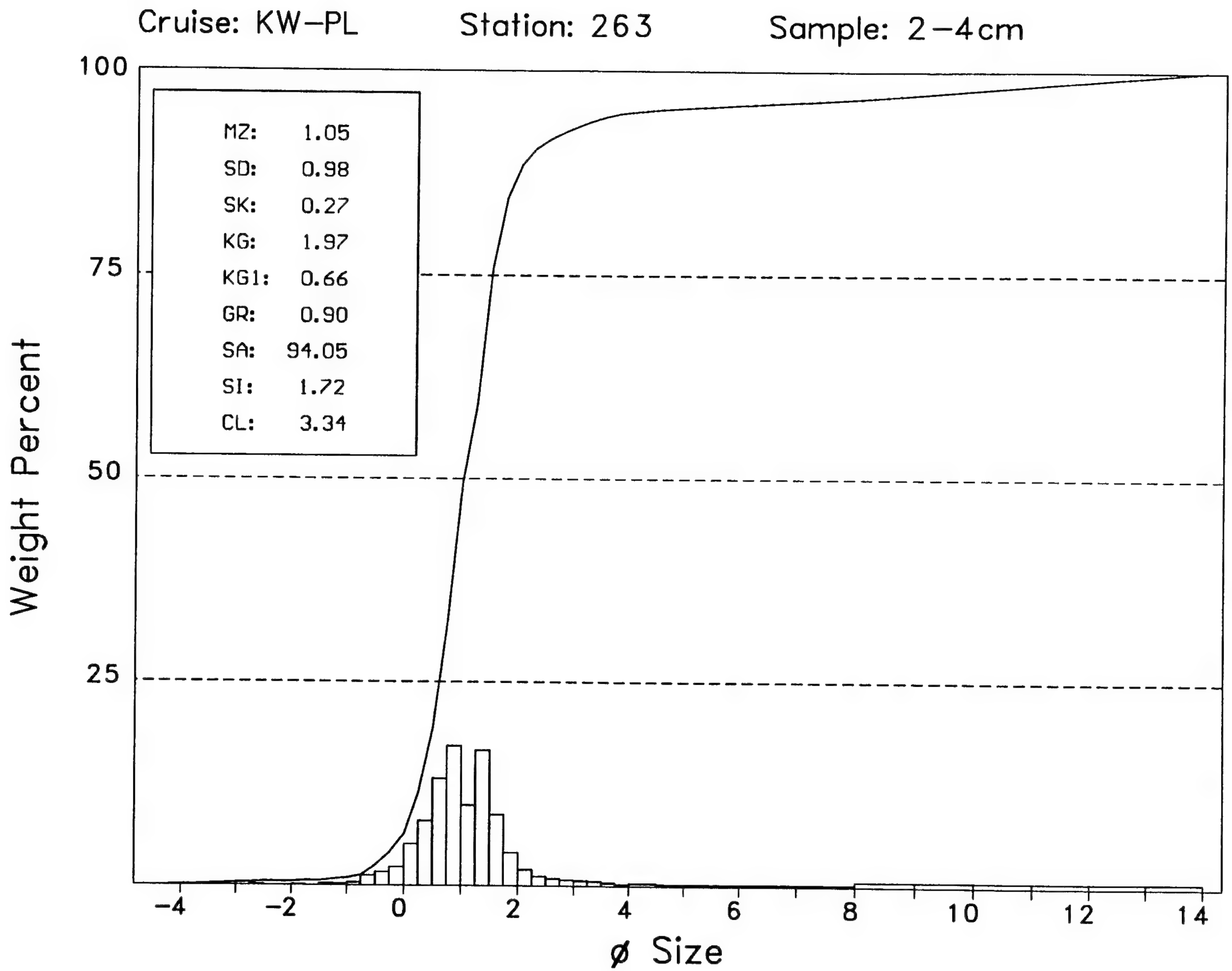


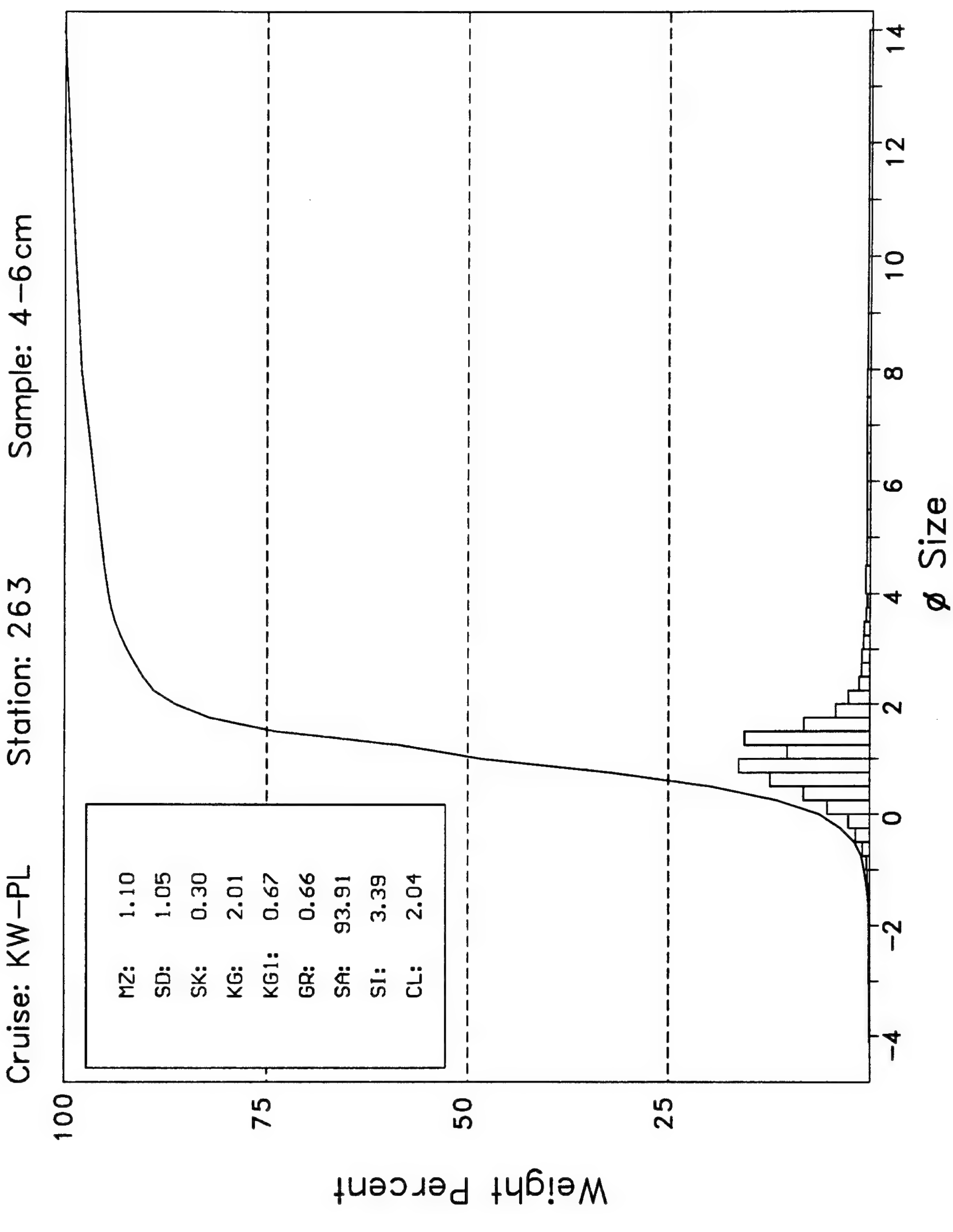
Cruise: KW-PL
Station: 244-2
Sample: 26-28
MZ: 6.64
SD: 3.84
SK: 0.40
KG: 0.76
KG1: 0.43
GR: 0.37
SA: 27.53
SI: 34.61
CL: 37.49
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

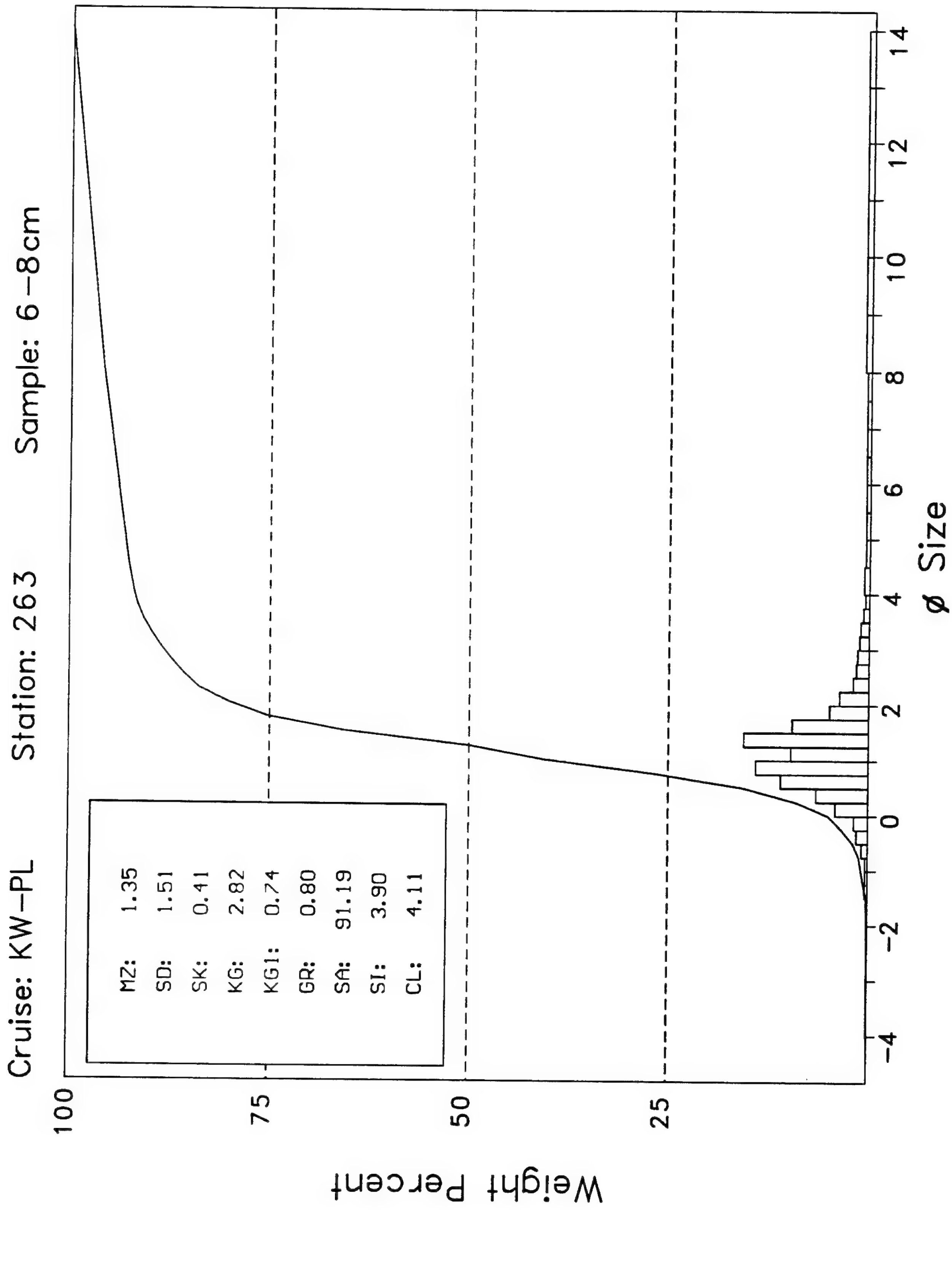

Cruise: KW-PL
Station: 244-2
Sample: 28-30
MZ: 6.36
SD: 4.17
SK: 0.46
KG: 0.74
KG1: 0.43
GR: 0.85
SA: 37.57
SI: 28.41
CL: 33.17
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14

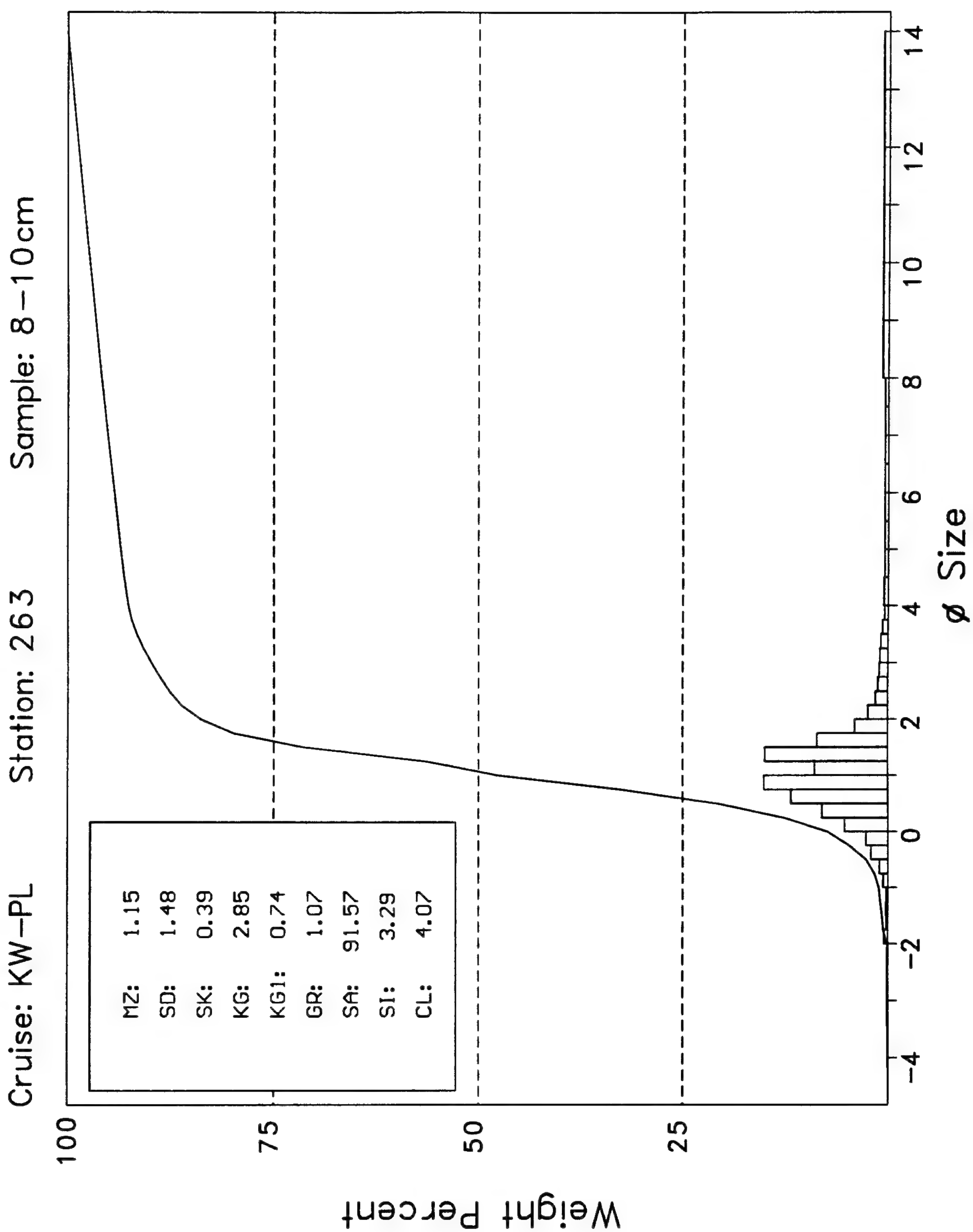


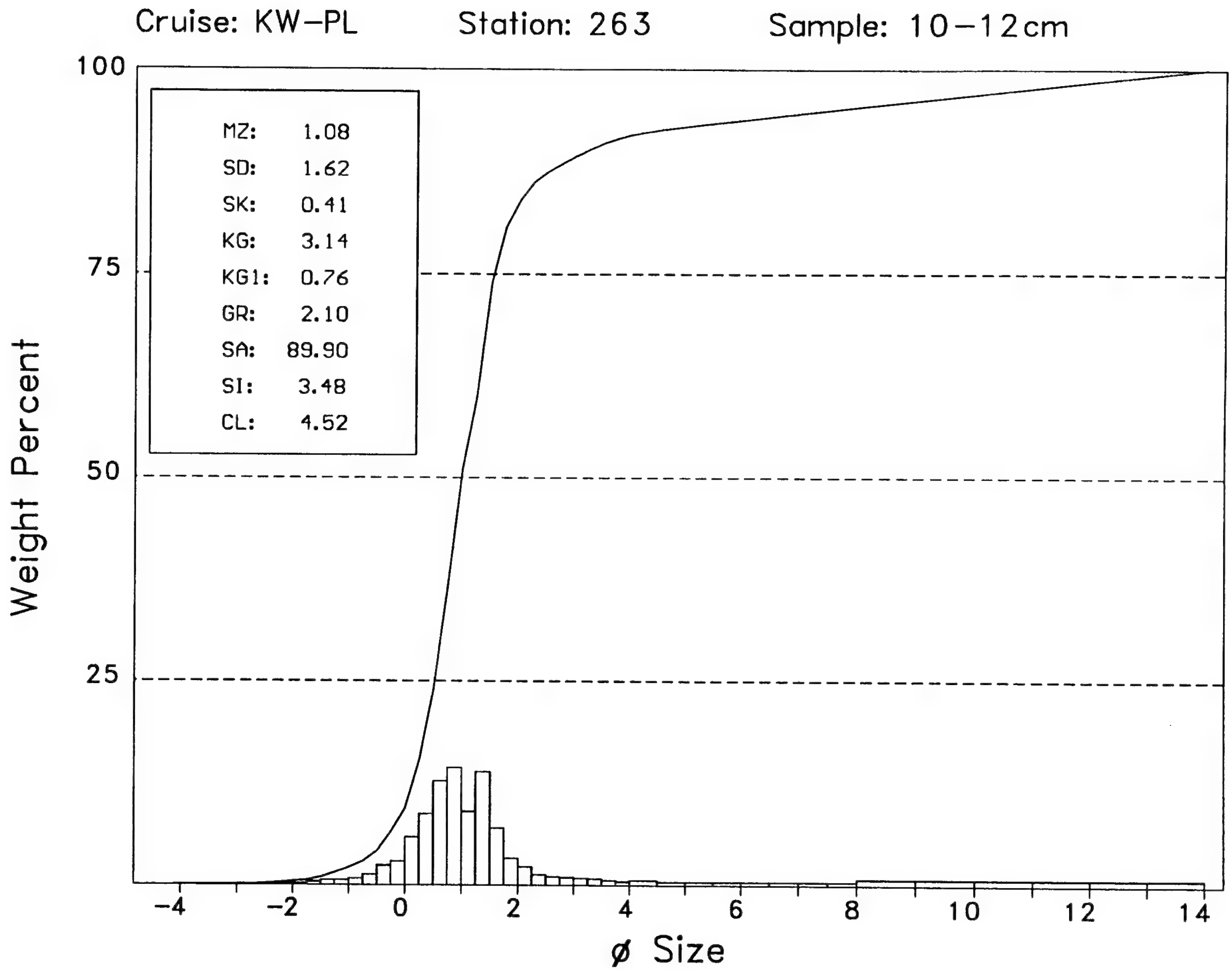
Cruise: KW-PL
Station: 263
Sample: 0-2cm
MZ: 1.00
SD: 1.33
SK: 0.38
KG: 2.90
KG1: 0.74
GR: 0.90
SA: 91.13
SI: 5.26
CL: 2.71
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14


Cruise: KW-PL
Station: 263
Sample: 2-4cm
MZ: 1.05
SD: 0.98
SK: 0.27
KG: 1.97
KG1: 0.66
GR: 0.90
SA: 94.05
SI: 1.72
CL: 3.34
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

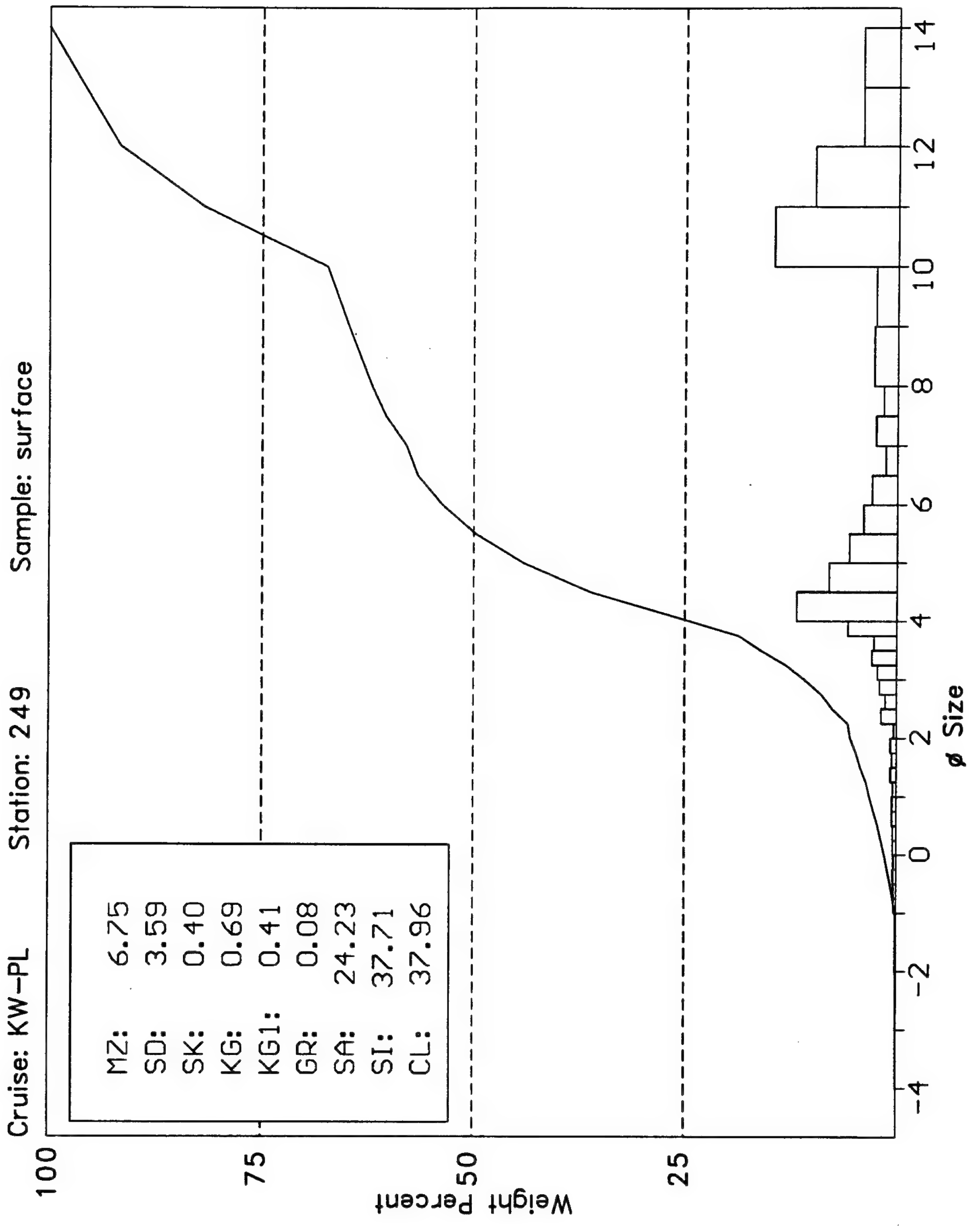

Cruise: KW–PL
Station: 263
Sample: 4–6cm
MZ: 1.10
SD: 1.05
SK: 0.30
KG: 2.01
KG1: 0.67
GR: 0.66
SA: 93.91
SI: 3.39
CL: 2.04
Weight Percent
100
75
50
25
ø Size
–4
–2
0
2
4
6
8
10
12
14

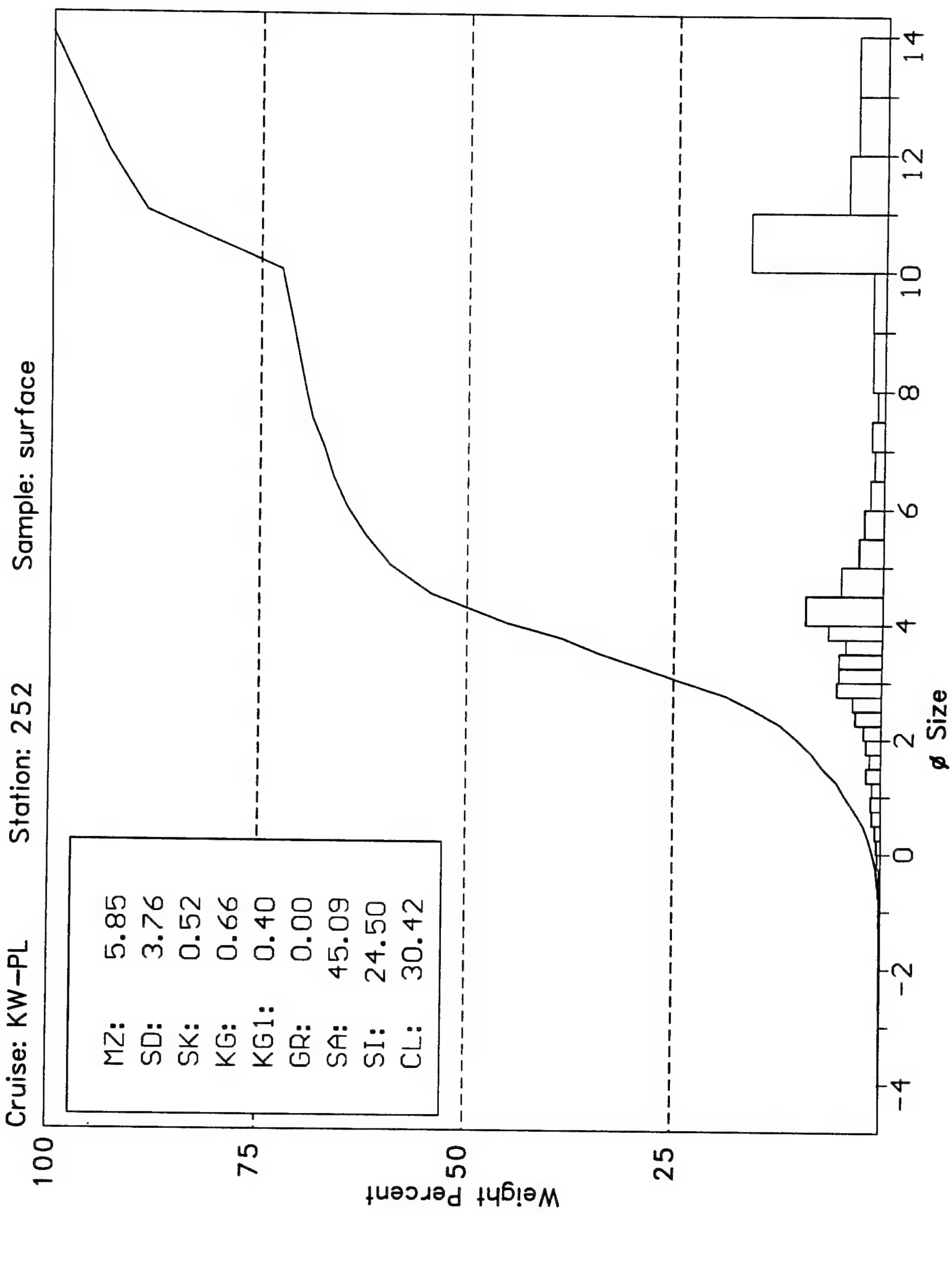

Cruise: KW-PL
Station: 263
Sample: 6-8cm
MZ: 1.35
SD: 1.51
SK: 0.41
KG: 2.82
KG1: 0.74
GR: 0.80
SA: 91.19
SI: 3.90
CL: 4.11
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

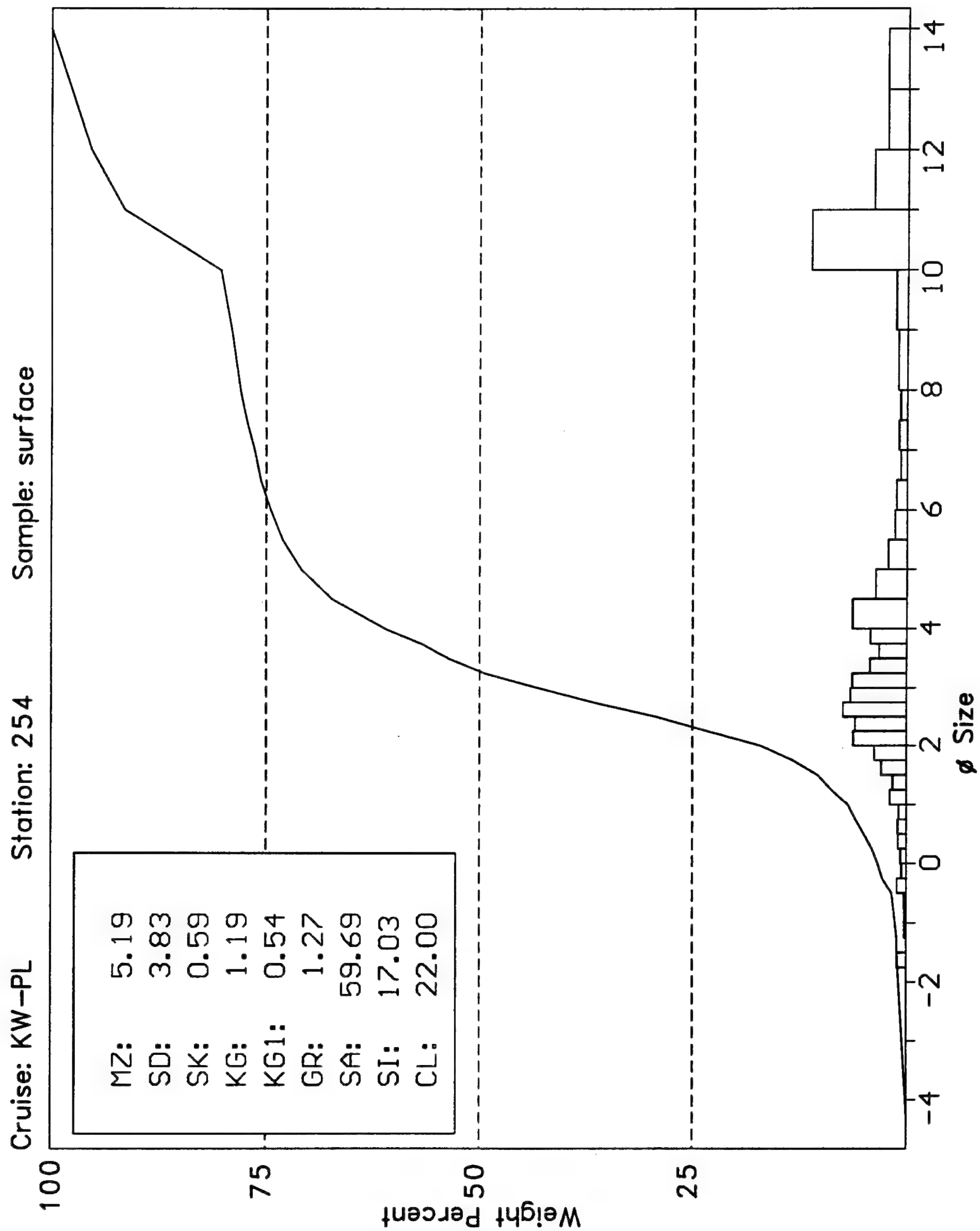

Cruise: KW-PL
Station: 263
Sample: 8-10cm
MZ: 1.15
SD: 1.48
SK: 0.39
KG: 2.85
KG1: 0.74
GR: 1.07
SA: 91.57
SI: 3.29
CL: 4.07
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size



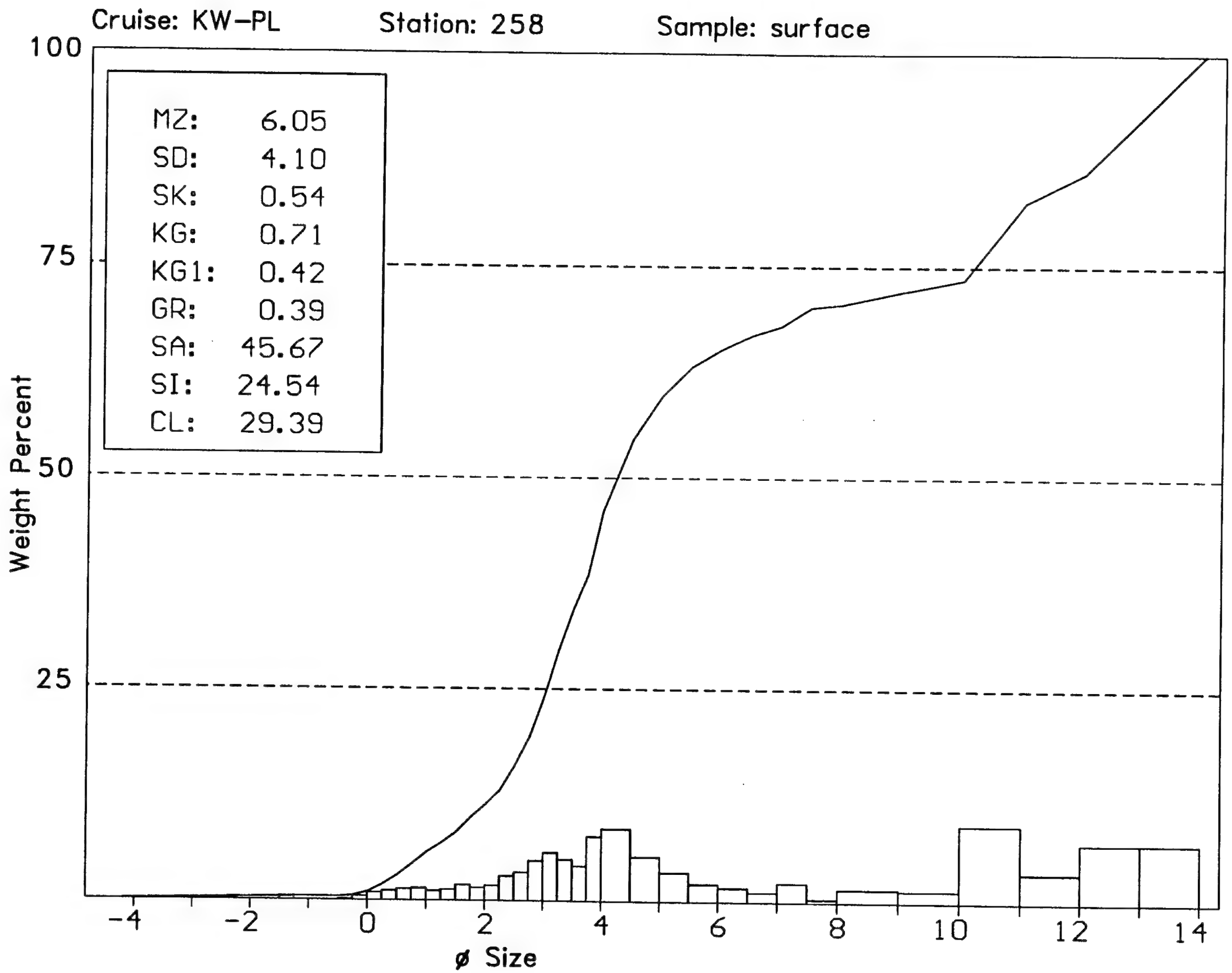
Cruise: KW-PL
Station: 263
Sample: 10-12cm
MZ: 1.08
SD: 1.62
SK: 0.41
KG: 3.14
KG1: 0.76
GR: 2.10
SA: 89.90
SI: 3.48
CL: 4.52
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

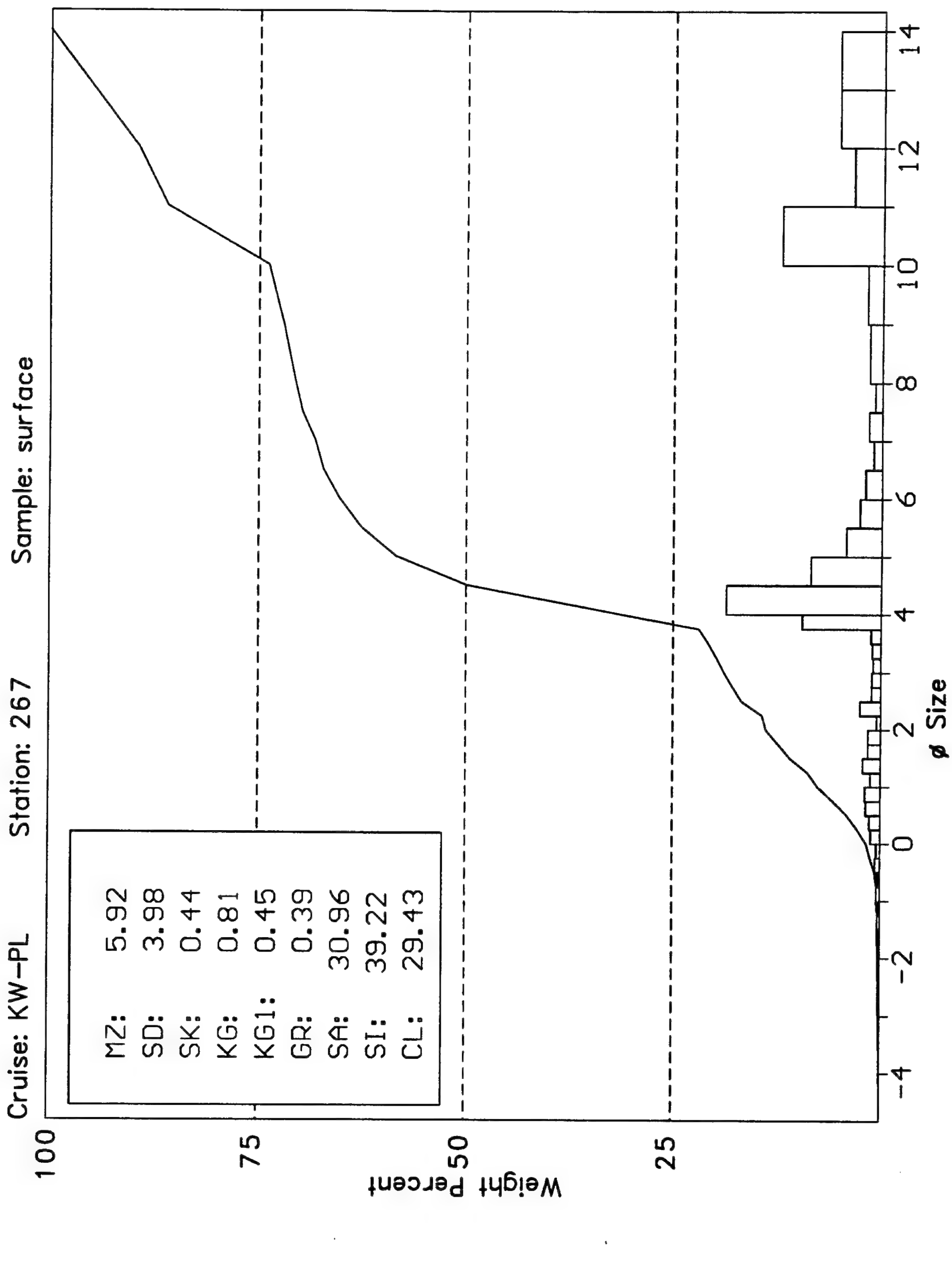

Cruise: KW-PL
Station: 249
Sample: surface
MZ: 6.75
SD: 3.59
SK: 0.40
KG: 0.69
KG1: 0.41
GR: 0.08
SA: 24.23
SI: 37.71
CL: 37.96
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size

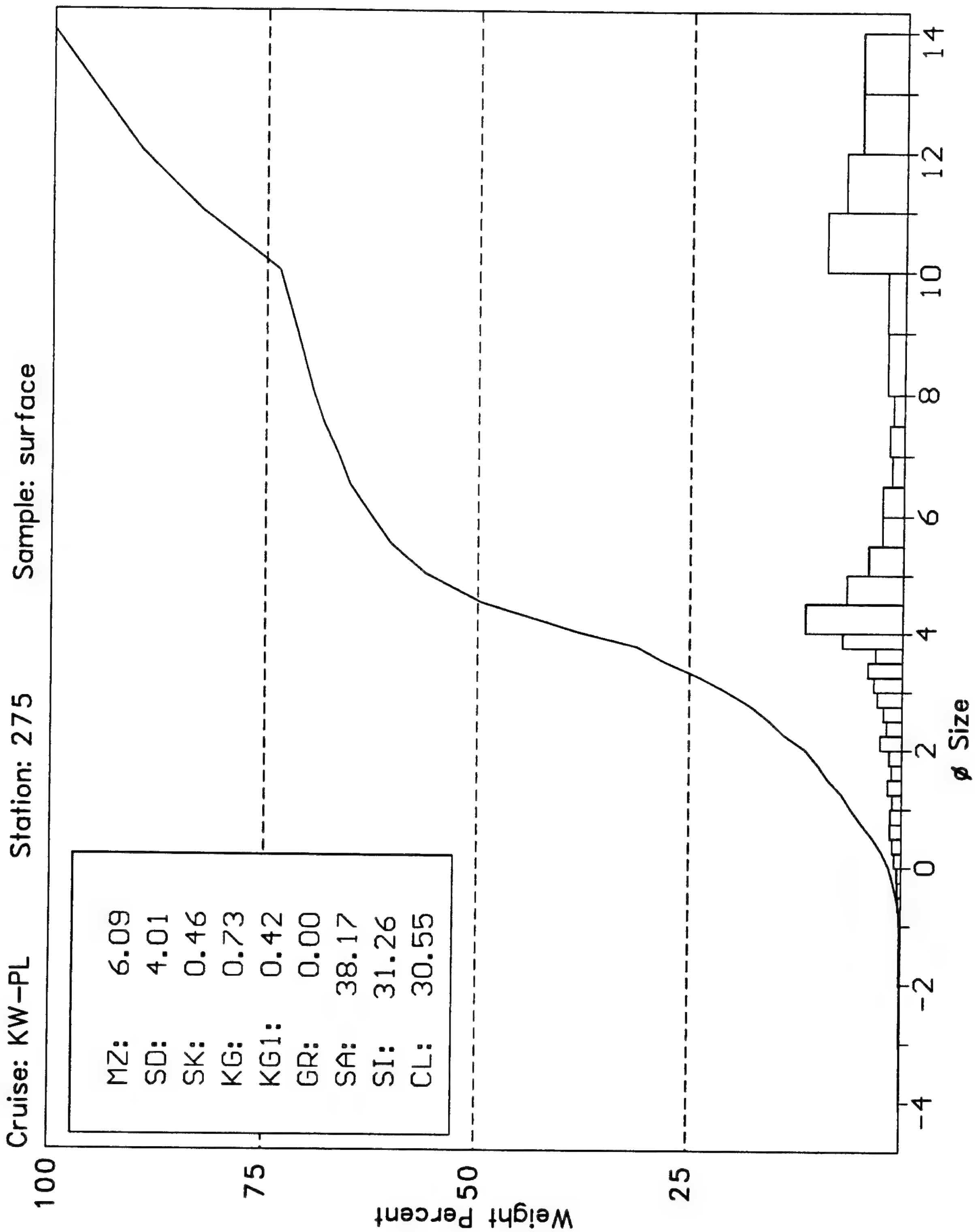

Cruise: KW-PL
Station: 252
Sample: surface
MZ: 5.85
SD: 3.76
SK: 0.52
KG: 0.66
KG1: 0.40
GR: 0.00
SA: 45.09
SI: 24.50
CL: 30.42
100
75
50
25
Weight Percent
-4
-2
0
2
4
6
8
10
12
14
ø Size



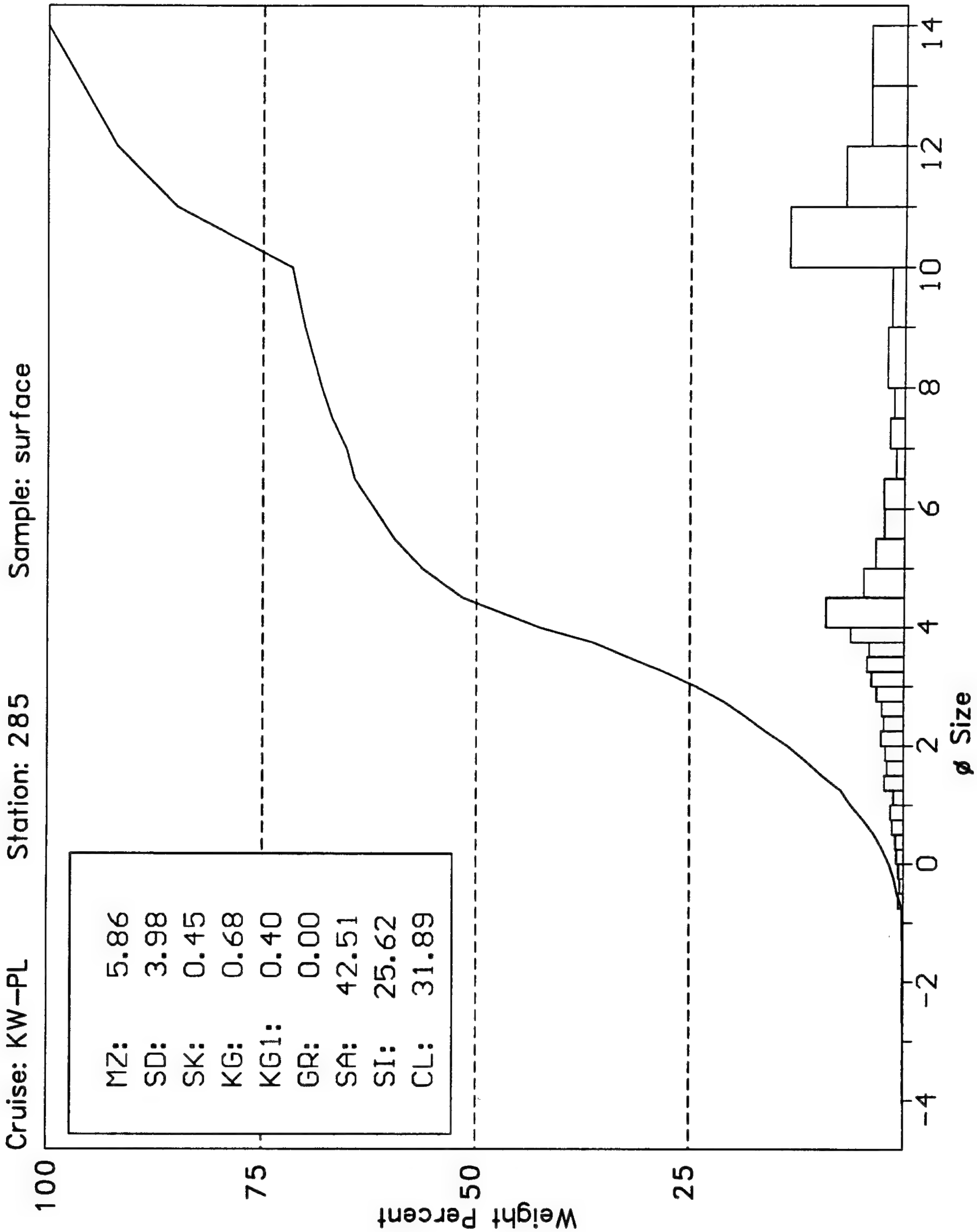
Cruise: KW-PL
Station: 254
Sample: surface
MZ: 5.19
SD: 3.83
SK: 0.59
KG: 1.19
KG1: 0.54
GR: 1.27
SA: 59.69
SI: 17.03
CL: 22.00
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size


Cruise: KW-PL
Station: 258
Sample: surface
MZ: 6.05
SD: 4.10
SK: 0.54
KG: 0.71
KG1: 0.42
GR: 0.39
SA: 45.67
SI: 24.54
CL: 29.39
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

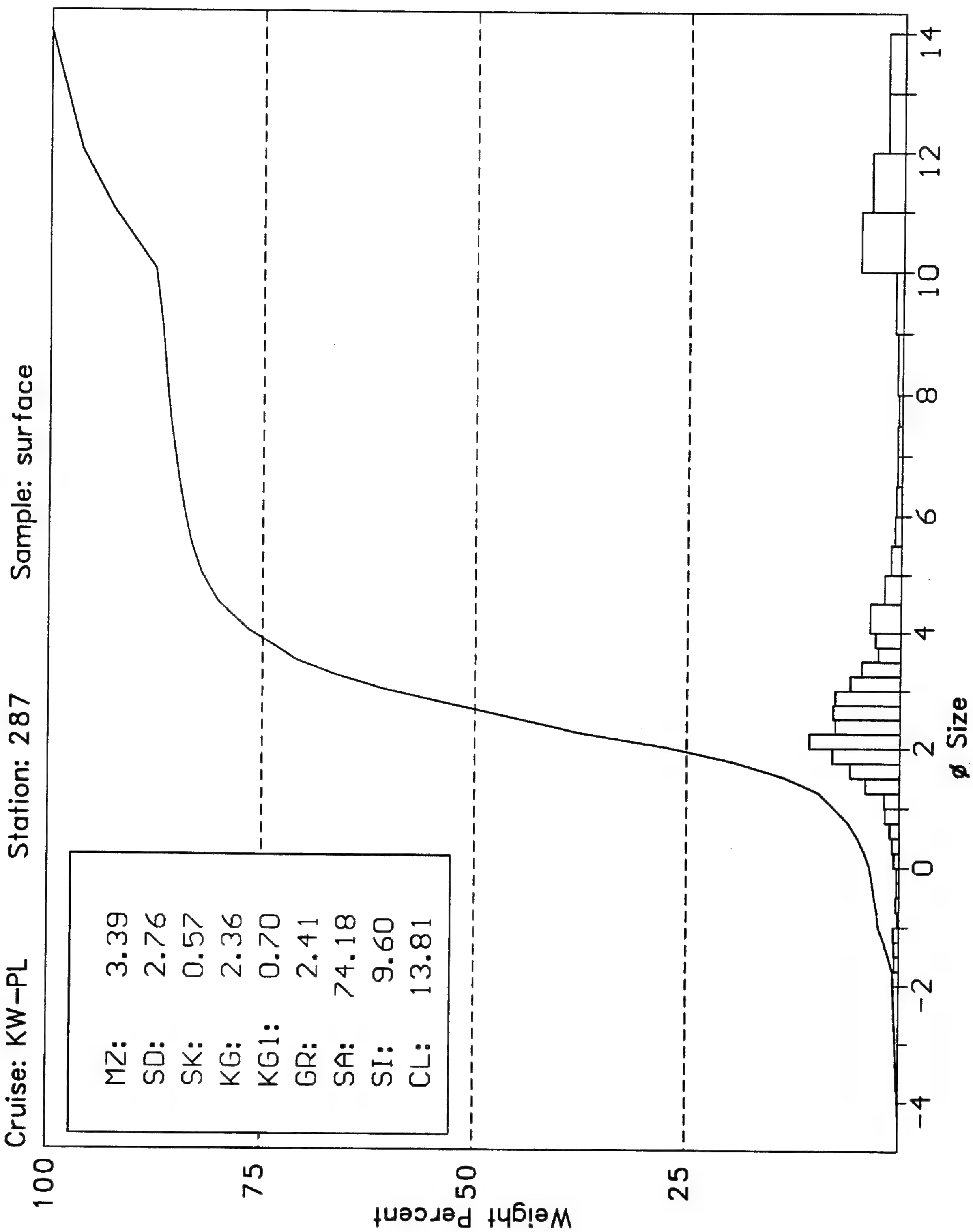

Cruise: KW-PL
Station: 267
Sample: surface
MZ: 5.92
SD: 3.98
SK: 0.44
KG: 0.81
KG1: 0.45
GR: 0.39
SA: 30.96
SI: 39.22
CL: 29.43
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14



Cruise: KW-PL
Station: 275
Sample: surface
MZ: 6.09
SD: 4.01
SK: 0.46
KG: 0.73
KG1: 0.42
GR: 0.00
SA: 38.17
SI: 31.26
CL: 30.55
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14



Cruise: KW-PL
Station: 285
Sample: surface
MZ: 5.86
SD: 3.98
SK: 0.45
KG: 0.68
KG1: 0.40
GR: 0.00
SA: 42.51
SI: 25.62
CL: 31.89
Weight Percent
100
75
50
25
ø Size
-4
-2
0
2
4
6
8
10
12
14



Cruise: KW-PL
Station: 287
Sample: surface
MZ: 3.39
SD: 2.76
SK: 0.57
KG: 2.36
KG1: 0.70
GR: 2.41
SA: 74.18
SI: 9.60
CL: 13.81
Weight Percent
100
75
50
25
-4
-2
0
2
4
6
8
10
12
14
ø Size

Table 3.1.1 Key West sediment data.

Cruise: Iselin Station: KW-73-1 date: 8 Feb 94
lat: 24-45.26 N long: 82-10.01 W depth: 23.5 m

calc for: 19.6 deg C 36.0 o/oo 23.5 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1534.6	1.009	234.1	0.585	66.48	1.59	1.98						
2	1543.1	1.014	234.1	0.585									
3	1536.9	1.010	261.8	0.654	63.94	1.65	1.77						
4	1535.8	1.010	471.9	1.180									
5					56.19	1.78	1.28						
6													
7					51.47	1.86	1.06						
8													
9					53.59	1.84	1.15						
10													
11					53.78	1.83	1.16						
12	1555.3	1.022	471.9	1.180									

Cruise: Iselin Station: KW-73-2 date: 8 Feb 94
lat: 24-45.26 N long: 82-10.01 W depth: 23.5 m

calc for: 19.6 deg C 36.0 o/oo 23.5 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1523.1	1.001	163.1	0.408	70.69	1.52	2.41	0.35	18.14	45.05	36.46	6.7	3.4
2	1530	1.006	204	0.51									
3	1531.2	1.006	242.7	0.607	62.58	1.67	1.67	17.12	16	34.66	32.22	4.68	5.51
4	1533.8	1.008	501.5	1.254									
5	1539.3	1.012	538.8	1.347	57.33	1.76	1.34	15.46	22.25	34.67	27.62	4.84	5.24
6	1541.2	1.013	589.6	1.474									
7					54.59	1.81	1.2	14.2	22.33	33.39	30.08	4.86	5.11
8													
9	1554.5	1.022	570.6	1.427	57.08	1.78	1.33	9.14	18.25	36.39	36.22	5.46	4.67
10	1550.2	1.019	463.3	1.158									
11	1545.5	1.016	538.8	1.347	53.73	1.83	1.16	9.52	20.67	35.48	34.33	5.27	4.63
12	1549.4	1.018	538.8	1.347									

Cruise: Iselin   Station: KW-88-1   date: 10 Feb 94
lat: 24-45.01 N   long: 82-11.97 W   depth: 24 m

calc for: 19.7 deg C 36.0 o/oo   24.0 m   400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1527.6	1.004	211.0	0.527	67.64	1.57	2.09	0.47	14.18	28.52	56.84	8.39	3.29
2	1529.5	1.005	242.7	0.607									
3	1526.5	1.003	234.1	0.585	62.58	1.67	1.67	0.01	15.48	46.11	38.39	7.01	3.43
4	1528.4	1.004	251.9	0.630									
5	1518.9	0.998	251.9	0.630	66.74	1.60	2.01	0.00	4.98	48.57	46.45	7.70	3.31
6	1516.6	0.997	211.0	0.527									
7	1512.5	0.994	251.9	0.630	66.63	1.60	2.00	0.81	15.46	41.93	41.80	7.20	3.67
8	1521.9	1.000	309.7	0.774									
9	1524.2	1.002	408.4	1.021	63.42	1.67	1.73	5.01	17.93	31.11	45.95	6.98	4.13
10	1535.7	1.009	426.6	1.066									
11	1536.1	1.010	440.1	1.100	55.58	1.80	1.25	8.74	19.44	37.84	33.98	5.89	4.37
12	1544.2	1.015	471.9	1.180									
13	1550.9	1.019	481.1	1.203	52.78	1.85	1.12	8.08	23.17	37.12	31.63	5.80	4.61
14	1552.5	1.020	501.5	1.254									
15	1546.6	1.016	538.8	1.347	53.74	1.83	1.16	7.07	23.06	38.13	31.74	5.79	4.41
16	1557.2	1.023	579.8	1.450									
17	1560.4	1.026	637.5	1.594	52.54	1.85	1.11	9.37	21.66	38.12	30.86	5.50	4.66
18	1556.8	1.023	688.3	1.721									
19	1547.8	1.017	637.5	1.594	51.97	1.86	1.08	17.61	20.97	34.41	27.01	4.60	5.25
20	1551.3	1.020	553.8	1.385									
21	1552.9	1.021	579.8	1.450	56.87	1.78	1.32	16.21	21.43	34.44	27.93	4.71	5.39
22	1554.8	1.022	688.3	1.721									

Cruise: Iselin   Station: KW-88-2   date: 10 Feb 94
lat: 24-45.01 N   long: 82-11.97 W   depth: 24 m

calc for: 19.7 deg C 36.0 o/oo   24.0 m   400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1529.5	1.005	197.4	0.493	67.06	1.58	2.04						
2	1539.6	1.012	240.4	0.601									
3	1533.0	1.008	224.6	0.562	64.92	1.63	1.85						
4	1536.5	1.010	268.1	0.670									
5	1546.2	1.016	290.0	0.725	59.84	1.72	1.49						
6	1541.9	1.013	294.9	0.737									
7	1543.4	1.014	268.1	0.670	60.26	1.71	1.52						
8	1544.2	1.015	280.8	0.702									
9	1548.1	1.017	388.7	0.972	57.41	1.77	1.35						
10	1550.5	1.019	545.2	1.363									
12	1544.2	1.015	742.6	1.856	54.79	1.82	1.21						
13	1562.4	1.027	643.9	1.610									
14	1554.4	1.022	742.6	1.856	54.18	1.83	1.18						

Cruise: Iselin Station: KW-93 date: 10 Feb 94
lat: 24-44.99 N long: 82-11.99 W depth: 24 m

calc for: 19.0 deg C 36.0 o/oo 24.0 m 400 kHz

smp core: 7.6 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1					60.39	1.69	1.52	0.83	22.03	26.07	51.07	8.13	3.92
10					55.75	1.80	1.26	16.73	23.60	33.84	25.83	4.58	5.32
20	1563.9	1.029	520.5	1.301	54.77	1.82	1.21	18.10	17.75	34.07	30.08	4.60	5.63
30	1576.0	1.037	482.0	1.205	51.65	1.87	1.07	3.99	20.89	43.74	31.37	6.35	3.83
45	1568.1	1.032	441.2	1.103	50.99	1.88	1.04	28.85	29.78	20.48	20.89	3.56	5.39
50	1553.6	1.022	374.1	0.935	54.07	1.83	1.18	2.76	15.53	41.42	40.28	7.19	3.97
60	1593.6	1.049	402.8	1.007	54.10	1.83	1.18	2.66	16.28	42.52	38.54	7.04	3.82
70	1531.9	1.008	341.2	0.853	54.86	1.81	1.22	1.15	12.25	44.88	41.72	7.47	3.68
80	1524.8	1.003	402.8	1.007	56.23	1.79	1.28	11.05	15.03	30.99	42.94	6.53	4.85
90	1535.3	1.010	430.3	1.076	56.60	1.78	1.30	10.93	14.40	32.25	42.42	6.69	4.56
100	1523.2	1.002	441.2	1.103	59.25	1.74	1.45	2.53	15.79	29.43	52.26	8.32	3.90
110	1523.2	1.002	387.5	0.969	56.20	1.79	1.28	1.34	23.54	24.54	50.58	8.02	4.12
120	1529.4	1.006	402.8	1.007	56.12	1.79	1.28	4.06	22.79	27.79	45.37	7.15	4.28
130	1529.7	1.007	402.8	1.007	54.88	1.81	1.22	6.97	23.05	23.93	46.05	6.98	4.50
140					52.27	1.86	1.09						

Cruise: Iselin Station: KW-123-1 date: 13 Feb 94
lat: 24-36.68 N long: 82-51.19 W depth: 27 m

calc for: 23.6 deg C 36.0 o/oo 27.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1533.9	1.001	171.4	0.429	69.40	1.55	2.27	0.01	23.65	37.60	38.75	6.63	3.32
2	1543.6	1.008	248.2	0.620									
3	1547.1	1.010	270.1	0.675	62.30	1.68	1.65	0.01	25.19	43.79	31.01	6.43	3.13
4	1549.1	1.011	270.1	0.675									
5	1553.0	1.014	314.3	0.786	58.96	1.74	1.44	0.56	25.14	38.44	35.86	6.54	3.06
6	1555.0	1.015	327.9	0.820									
7	1553.4	1.014	368.8	0.922	58.24	1.75	1.39	0.46	23.96	40.18	35.40	6.42	3.14
8	1558.5	1.018	327.9	0.820									
9	1560.5	1.019	314.3	0.786	55.72	1.80	1.26	0.39	28.41	40.53	30.67	6.21	3.29
10	1556.2	1.016	314.3	0.786									
11	1558.9	1.018	314.3	0.786	55.72	1.80	1.26	0.24	24.75	36.95	38.06	6.49	3.20
12	1561.3	1.019	320.9	0.802									
13	1567.4	1.023	359.6	0.899	55.91	1.79	1.27	0.70	22.84	38.37	38.09	6.53	3.18
14	1567.0	1.023	342.9	0.857									
15	1563.7	1.021	359.6	0.899	55.95	1.79	1.27	0.98	22.98	38.06	37.98	6.46	3.25
16	1562.5	1.020	368.8	0.922									
17	1560.9	1.019	359.6	0.899	56.36	1.79	1.29	1.09	20.70	33.29	44.91	7.06	3.54
18	1564.9	1.022	327.9	0.820									
19	1564.9	1.022	327.9	0.820	55.56	1.80	1.25	0.05	23.74	41.13	35.08	6.59	3.43
20	1564.9	1.022	351.0	0.878									
21	1564.1	1.021	368.8	0.922	55.09	1.81	1.23	0.13	23.70	39.41	36.77	6.63	3.40
22	1560.1	1.019	359.6	0.899									
23	1559.7	1.018	327.9	0.820	54.20	1.82	1.18	1.08	27.75	37.52	33.66	6.36	3.41
24	1569.4	1.025	378.7	0.947									
25	1571.4	1.026	378.7	0.947	54.06	1.84	1.18	0.56	21.74	39.09	38.61	6.62	3.51
26	1565.3	1.022	351.0	0.878									
27	1567.4	1.023	335.2	0.838	53.43	1.86	1.15	0.69	25.71	40.05	33.55	6.53	3.56
28	1571.4	1.026	351.0	0.878									
29	1573.0	1.027	351.0	0.878	53.65	1.86	1.16	0.59	28.74	36.97	33.70	6.37	3.40
30	1573.0	1.027	342.9	0.857									
31	1569.8	1.025	342.9	0.857	53.81	1.86	1.16	0.92	22.40	35.86	40.82	6.77	3.47
32	1568.2	1.024	342.9	0.857									

Cruise: Iselin Station: KW-123-2 date: 13 Feb 94
lat: 24-36.68 N long: 82-51.19 W depth: 27 m

calc for: 23.6 deg C 36.0 o/oo 27.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1533.4	1.001	211.0	0.527	68.88	1.56	2.21						
2	1548.6	1.011	204.0	0.510									
3	1551.4	1.013	309.7	0.774	61.03	1.70	1.57						
4	1556.5	1.016	304.1	0.760									
5	1562.9	1.020	315.5	0.789	58.19	1.75	1.39						
6	1566.5	1.023	334.5	0.836									
7	1566.5	1.023	334.5	0.836	57.08	1.77	1.33						
8	1568.5	1.024	356.4	0.891									
9	1565.3	1.022	356.4	0.891	56.80	1.78	1.32						
10	1563.7	1.021	341.4	0.854									
11	1563.3	1.021	341.4	0.854	56.30	1.79	1.29						
12	1564.1	1.021	341.4	0.854									
13	1566.5	1.023	341.4	0.854	55.53	1.80	1.25						
14	1562.1	1.020	373.2	0.933									
15	1558.5	1.017	356.4	0.891	55.96	1.79	1.27						
16	1565.7	1.022	356.4	0.891									
17	1566.1	1.022	356.4	0.891	55.84	1.79	1.26						
18	1558.1	1.017	356.4	0.891									
19	1562.1	1.020	327.9	0.820	54.71	1.81	1.21						
20	1560.5	1.019	341.4	0.854									
21	1561.3	1.019	341.4	0.854	54.48	1.82	1.20						
22	1566.1	1.022	341.4	0.854									
23	1564.5	1.021	334.5	0.836	54.07	1.82	1.18						
24	1566.1	1.022	334.5	0.836									
25	1569.3	1.025	348.7	0.872	54.06	1.84	1.18						
26	1568.9	1.024	341.4	0.854									
27	1570.1	1.025	392.2	0.981	53.64	1.86	1.16						
28	1573.7	1.027	382.4	0.956									
29	1570.9	1.026	373.2	0.933	54.73	1.84	1.21						

Cruise: Iselin Station: KW-127 date: 13 Feb 94
lat: 24-36.68 N long: 82-51.20 W depth: 27 m

calc for: 24.0 deg C 36.0 o/oo 27.0 m 400 kHz

smp core: 7.6 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1								0.25	28.80	38.96	31.98	6.39	3.51
10	1588.8	1.037	381.3	0.953	53.09	1.84	1.13	0.45	26.15	42.12	31.28	6.42	3.48
20	1578.6	1.030	374.4	0.936	53.90	1.83	1.17	2.61	26.51	37.57	33.31	6.59	3.92
30	1592.5	1.039	514.3	1.286	52.80	1.90	1.12	2.68	38.68	30.52	28.12	6.00	4.05
40	1601.2	1.045	593.5	1.484	52.73	1.86	1.12	4.65	38.06	28.37	28.92	5.85	4.00
50	1596.2	1.041	514.3	1.286	53.89	1.90	1.17	1.46	41.33	30.22	26.99	5.82	3.90
60	1587.9	1.036	460.6	1.151	50.80	1.91	1.03	3.95	46.98	22.90	26.16	5.54	4.20
70	1599.8	1.044	555.0	1.388	52.95	1.87	1.13	1.76	47.71	24.64	25.89	5.58	4.11
80	1599.8	1.044	555.0	1.388	51.83	1.89	1.08	7.20	48.67	21.19	22.94	5.10	4.67
90	1605.9	1.048	484.3	1.211	50.96	1.91	1.04	1.44	40.61	29.57	28.38	5.91	3.95
100	1585.9	1.035	698.2	1.746	50.36	1.92	1.01	6.72	48.58	19.56	25.14	5.18	4.50
110					49.16	1.94	0.97	5.25	43.61	23.99	27.14	5.32	4.46
120					49.53	1.93	0.98	6.00	45.16	20.85	27.98	5.28	4.56
130					48.05	1.94	0.93	11.19	47.14	16.60	25.06	4.59	5.05

Cruise: Planet Station: KWPL 94-1 date: 11 Feb 95
lat: 24-36.80 N long: 82-50.89 W depth: 26 m

calc for: 21.0 deg C 36.0 o/oo 26.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1516.8	0.995	170.0	0.425	75.50	1.46	3.08						
2	1523.7	0.999	197.1	0.493									
3	1528.3	1.002	223.8	0.560	68.45	1.58	2.17						
4	1535.7	1.007	261.0	0.653									
5	1547.4	1.015	314.6	0.786	61.65	1.70	1.61						
6	1549.0	1.016	314.6	0.786									
7	1544.7	1.013	299.9	0.750	60.40	1.73	1.53						
8	1541.9	1.011	279.1	0.698									
9	1543.5	1.012	291.7	0.729	61.18	1.72	1.58						
10	1545.8	1.014	302.7	0.757									
11	1547.0	1.014	314.6	0.786	60.41	1.73	1.53						
12	1546.2	1.014	305.6	0.764									
13	1544.7	1.013	289.1	0.723	59.26	1.75	1.45						
14	1549.8	1.016	320.9	0.802									
15	1547.0	1.014	345.6	0.864	59.07	1.75	1.44						
16	1531.0	1.004	419.6	1.049									
17	1528.3	1.002	308.5	0.771	56.88	1.79	1.32						
18	1530.6	1.004	320.9	0.802									
19	1534.5	1.006	370.8	0.927	61.41	1.71	1.59						
20	1550.2	1.016	341.8	0.854									
21	1551.0	1.017	338.1	0.845	57.23	1.79	1.34						
22	1548.6	1.015	331.0	0.827									
23	1549.0	1.016	349.5	0.874	56.51	1.80	1.30						
24	1549.4	1.016	338.1	0.845									
25	1555.8	1.020	317.7	0.794	57.51	1.78	1.35						
26	1556.6	1.021	341.8	0.854									
27	1555.0	1.020	341.8	0.854	57.70	1.78	1.36						
28	1552.6	1.018	341.8	0.854									
29	1555.4	1.020	366.3	0.916	55.97	1.82	1.27						
30	1559.0	1.022	357.6	0.894									

Cruise: Planet Station:KWPL 94-2 date: 11 Feb 95
lat: 24-36.80 N long: 82-50.89 W depth: 26 m

calc for: 21.0 deg C 36.0 o/oo 26.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1516.8	0.995	165.4	0.414									
2	1522.5	0.998	217.9	0.545									
3	1528.7	1.002	219.5	0.549									
4	1533.3	1.005	217.9	0.545									
5	1539.2	1.009	274.1	0.685									
6	1543.9	1.012	286.1	0.715									
7	1546.6	1.014	293.8	0.734									
8	1549.8	1.016	296.4	0.741									
9	1551.8	1.017	310.5	0.776									
10	1553.0	1.018	329.6	0.824									
11	1556.2	1.020	340.1	0.850									
12	1557.4	1.021	340.1	0.850									
13	1552.2	1.018	326.2	0.816									
14	1549.0	1.016	313.5	0.784									
15	1551.8	1.017	329.6	0.824									
16	1554.6	1.019	340.1	0.850									
17	1552.6	1.018	333.0	0.832									
18	1551.8	1.017	329.6	0.824									
19	1555.8	1.020	355.5	0.889									
20	1552.2	1.018	340.1	0.850									
21	1548.6	1.015	326.2	0.816									
22	1551.8	1.017	333.0	0.832									
23	1555.8	1.020	333.0	0.832									
24	1556.6	1.021	343.8	0.860									
25	1558.2	1.022	340.1	0.850									
26	1557.0	1.021	347.6	0.869									
27	1555.4	1.020	333.0	0.832									
28	1559.0	1.022	351.5	0.879									
29	1564.2	1.026	387.3	0.968									
30	1561.0	1.024	377.5	0.944									

Cruise: Planet   Station: KWPL 99-1   date: 12 Feb 95
lat: 24-36.80 N   long: 82-50.89 W   depth: 26 m

calc for: 21.0 deg C 36.0 o/oo   26.0 m   400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1527.9	1.002	219.5	0.549	70.10	1.55	2.34						
2	1537.2	1.008	241.4	0.604									
3	1540.3	1.010	267.4	0.668	63.64	1.66	1.75						
4	1543.9	1.012	283.6	0.709									
5	1547.8	1.015	307.6	0.769	61.29	1.71	1.58						
6	1551.0	1.017	322.9	0.807									
7	1548.2	1.015	316.6	0.792	59.74	1.74	1.48						
8	1545.8	1.014	304.7	0.762									
9	1548.6	1.015	301.9	0.755	59.05	1.75	1.44						
10	1550.6	1.017	313.5	0.784									
11	1550.6	1.017	316.6	0.792	58.74	1.76	1.42						
12	1550.2	1.016	316.6	0.792									
13	1550.2	1.016	319.7	0.799	59.17	1.75	1.45						
14	1551.4	1.017	322.9	0.807									
15	1553.8	1.019	329.6	0.824	58.13	1.77	1.39						
16	1553.0	1.018	343.8	0.860									
17	1548.6	1.015	336.5	0.841	56.56	1.80	1.30						
18	1544.7	1.013	310.5	0.776									
19	1545.4	1.013	326.2	0.816	58.05	1.77	1.38						
20	1549.4	1.016	347.6	0.869									
21	1549.8	1.016	322.9	0.807	57.29	1.79	1.34						
22	1551.8	1.017	340.1	0.850									
23	1551.0	1.017	336.5	0.841	56.17	1.81	1.28						
24	1548.6	1.015	333.0	0.832									
25	1547.8	1.015	343.8	0.860	57.15	1.79	1.33						
26	1546.6	1.014	368.3	0.921									
27	1550.2	1.016	347.6	0.869	56.53	1.80	1.30						
28	1551.0	1.017	343.8	0.860									
29	1552.2	1.018	333.0	0.832	57.50	1.79	1.35						
30	1550.6	1.017	359.6	0.899									
31	1555.0	1.020	363.9	0.910	55.14	1.83	1.23						
32	1556.2	1.020	359.6	0.899									

Cruise: Planet Station: KWPL 99-2 date: 12 Feb 95
lat: 24-36.80 N long: 82-50.89 W depth: 26 m

calc for: 21.0 deg C 36.0 o/oo 26.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1526.8	1.001	215.5	0.539									
2	1534.9	1.006	239.0	0.598									
3	1541.5	1.011	267.2	0.668									
4	1544.3	1.013	286.2	0.716									
5	1549.4	1.016	311.2	0.778									
6	1546.6	1.014	281.2	0.703									
7	1545.0	1.013	281.2	0.703									
8	1547.4	1.015	294.1	0.735									
9	1549.8	1.016	305.2	0.763									
10	1552.2	1.018	314.2	0.786									
11	1551.4	1.017	314.2	0.786									
12	1551.0	1.017	314.2	0.786									
13	1550.6	1.017	311.2	0.778									
14	1552.6	1.018	317.4	0.793									
15	1555.8	1.020	320.6	0.801									
16	1554.2	1.019	317.4	0.793									
17	1555.8	1.020	330.6	0.827									
18	1554.2	1.019	357.3	0.893									
19	1556.2	1.020	357.3	0.893									
20	1557.4	1.021	341.4	0.854									
21	1555.8	1.020	341.4	0.854									
22	1554.2	1.019	375.1	0.938									
23	1555.0	1.020	365.9	0.915									
24	1551.4	1.017	334.1	0.835									
25	1549.4	1.016	345.2	0.863									
26	1551.8	1.017	323.8	0.810									
27	1554.6	1.019	345.2	0.863									
28	1552.2	1.018	357.3	0.893									
29	1553.8	1.019	349.1	0.873									
30	1552.6	1.018	345.2	0.863									
31	1553.4	1.019	345.2	0.863									
32	1556.6	1.021	361.5	0.904									
33	1557.4	1.021	337.7	0.844									
34	1560.2	1.023	353.2	0.883									
35	1560.2	1.023	353.2	0.883									
36	1558.6	1.022	375.1	0.938									
37	1562.2	1.024	406.9	1.017									

Cruise: Planet Station: KWPL 113-1 date: 13 Feb 95
lat: 24-36.81 N long: 82-50.89 W depth: 26 m

calc for: 21.0 deg C 36.0 o/oo 26.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1517.2	0.995	155.1	0.388									
2	1524.4	1.000	208.3	0.521									
3	1530.2	1.003	228.8	0.572									
4	1537.2	1.008	261.0	0.653									
5	1547.8	1.015	311.5	0.779									
6	1551.4	1.017	324.2	0.810									
7	1550.6	1.017	308.5	0.771									
8	1552.2	1.018	327.5	0.819									
9	1549.8	1.016	320.9	0.802									
10	1551.0	1.017	314.6	0.786									
11	1551.8	1.017	317.7	0.794									
12	1553.0	1.018	320.9	0.802									
13	1548.6	1.015	317.7	0.794									
14	1545.8	1.014	299.9	0.750									
15	1548.2	1.015	314.6	0.786									
16	1547.0	1.014	299.9	0.750									
17	1556.6	1.021	297.1	0.743									
18	1559.8	1.023	302.7	0.757									
19	1552.6	1.018	317.7	0.794									
20	1544.3	1.013	317.7	0.794									
21	1544.3	1.013	320.9	0.802									
22	1539.9	1.010	327.5	0.819									
23	1539.6	1.009	320.9	0.802									
24	1542.3	1.011	341.8	0.854									
25	1548.6	1.015	341.8	0.854									

Cruise: Planet Station: KWPL 113-2 date: 13 Feb 95
lat: 24-36.81 N long: 82-50.89 W depth: 26 m

calc for: 21.0 deg C 36.0 o/oo 26.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1522.5	0.998	195.8	0.489	73.87	1.48	2.83	0.00	19.71	43.07	37.21	6.91	3.41
2	1527.1	1.001	212.4	0.531									
3	1532.9	1.005	238.0	0.595	64.54	1.64	1.82	0.03	28.45	38.84	32.68	6.44	3.47
4	1543.9	1.012	295.8	0.739									
5	1549.8	1.016	318.6	0.796	59.81	1.73	1.49	0.05	32.99	35.32	31.63	6.20	3.52
6	1549.8	1.016	321.7	0.804									
7	1547.4	1.015	315.5	0.789	58.75	1.76	1.42	0.08	33.76	36.24	29.92	6.38	3.64
8	1549.4	1.016	324.9	0.812									
9	1554.2	1.019	335.0	0.837	57.37	1.78	1.35	0.48	24.61	41.75	33.16	6.70	3.51
10	1553.0	1.018	335.0	0.837									
11	1553.0	1.018	331.6	0.829	57.42	1.79	1.35	0.06	36.54	34.81	28.58	6.19	3.71
12	1555.4	1.020	349.6	0.874									
13	1553.8	1.019	338.5	0.846	58.12	1.77	1.39	1.00	28.56	37.72	32.72	6.46	3.76
14	1551.0	1.017	335.0	0.837									
15	1549.4	1.016	335.0	0.837	56.45	1.80	1.30	0.07	27.95	41.42	30.56	6.57	3.57
16	1550.6	1.017	335.0	0.837									
17	1551.4	1.017	338.5	0.846	56.92	1.79	1.32	1.91	27.73	40.89	29.48	6.45	3.78
18	1552.6	1.018	353.5	0.884									
19	1551.8	1.017	374.8	0.937	56.67	1.80	1.31	1.01	22.03	41.41	35.54	6.82	3.55
20	1547.0	1.014	357.5	0.894									
21	1547.8	1.015	335.0	0.837	56.88	1.79	1.32	0.36	21.98	39.95	37.70	6.89	3.51
22	1546.2	1.014	318.6	0.796									
23	1544.7	1.013	318.6	0.796	57.28	1.79	1.34	0.15	23.06	40.27	36.53	6.83	3.47
24	1548.6	1.015	328.2	0.820									
25	1549.0	1.016	331.6	0.829	57.06	1.79	1.33	0.34	25.92	37.73	36.02	6.69	3.53
26	1547.0	1.014	335.0	0.837									
27	1552.2	1.018	357.5	0.894	54.32	1.85	1.19	0.54	30.00	35.25	34.21	6.49	3.75

Cruise: Planet **Station: KWPL 173-1** **date: 18 Feb 95**
lat: 24-36.24 N **long: 82-51.18 W** **depth: 27 m**

calc for: 21.0 deg C 36.0 o/oo 27.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1528.0	1.002	188.5	0.471	69.03	1.57	2.23	0.05	31.13	36.86	31.95	6.50	3.74
2	1536.4	1.007	237.1	0.593									
3	1540.3	1.010	264.6	0.662	64.14	1.65	1.79	0.13	30.78	34.45	34.64	6.57	3.87
4	1542.6	1.011	280.7	0.702									
5	1548.1	1.015	306.2	0.766	59.48	1.74	1.47	0.09	35.62	33.12	31.17	6.50	4.06
6	1552.4	1.018	316.8	0.792									
7	1553.2	1.018	306.2	0.766	59.43	1.74	1.46	0.51	33.11	31.84	34.55	6.37	3.80
8	1553.6	1.019	316.8	0.792									
9	1554.4	1.019	340.6	0.851	58.57	1.76	1.41	0.11	28.45	38.36	33.08	6.62	3.76
10	1556.0	1.020	350.6	0.877									
11	1560.0	1.023	350.6	0.877	56.29	1.80	1.29	0.39	41.62	24.31	33.68	6.29	4.37
12	1558.8	1.022	350.6	0.877									
13	1562.8	1.025	369.1	0.923	56.43	1.80	1.30	0.32	32.46	28.22	39.00	6.81	4.01
14	1564.8	1.026	381.5	0.954									
15	1562.8	1.025	377.3	0.943	55.99	1.81	1.27	0.13	48.79	16.29	34.79	6.34	4.42
16	1564.0	1.025	357.7	0.894									
17	1567.2	1.028	365.2	0.913	55.34	1.82	1.24	15.19	24.10	30.22	30.49	4.98	5.24
18	1566.8	1.027	390.4	0.976									
19	1559.2	1.022	369.1	0.923	55.56	1.82	1.25	1.99	35.18	29.93	32.90	6.30	4.27
20	1559.6	1.023	385.9	0.965									
21	1556.8	1.021	381.5	0.954	56.32	1.80	1.29	2.81	31.63	30.95	34.62	6.45	4.08
22	1556.8	1.021	381.5	0.954									
23	1550.1	1.016	432.9	1.082	57.84	1.78	1.37	0.47	43.48	25.87	30.18	6.08	4.14
24	1542.6	1.011	432.9	1.082									
25	1550.5	1.017	404.9	1.012	54.97	1.83	1.22	3.79	36.00	28.46	31.75	6.18	4.21
26	1550.5	1.017	432.9	1.082									
27	1546.9	1.014	514.2	1.285	54.17	1.84	1.18	6.92	36.51	25.04	31.52	5.82	4.61
28	1554.8	1.019	404.9	1.012									
29	1558.8	1.022	395.1	0.988	53.71	1.86	1.16	1.70	41.50	24.61	32.20	6.12	4.21
30	1561.6	1.024	404.9	1.012									
31	1566.0	1.027	439.3	1.098	53.20	1.87	1.14	0.76	36.46	29.84	32.94	6.38	3.96

Cruise: Planet   Station: KWPL 173-2   date: 18 Feb 95
lat: 24-36.24 N   long: 82-51.18 W   depth: 27 m

calc for: 21.0 deg C   36.0 o/oo   27.0 m   400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1529.6	1.003	217.2	0.543									
2	1535.0	1.006	231.9	0.580									
3	1540.8	1.010	261.0	0.653									
4	1544.3	1.013	285.8	0.715									
5	1547.8	1.015	305.2	0.763									
6	1551.7	1.017	313.2	0.783									
7	1553.3	1.018	321.6	0.804									
8	1552.1	1.018	315.9	0.790									
9	1552.9	1.018	313.2	0.783									
10	1553.3	1.018	318.8	0.797									
11	1553.3	1.018	327.6	0.819									
12	1552.5	1.018	333.8	0.834									
13	1551.7	1.017	324.6	0.811									
14	1555.3	1.020	357.8	0.895									
15	1555.3	1.020	347.0	0.868									
16	1565.3	1.026	365.5	0.914									
17	1566.1	1.027	365.5	0.914									
18	1565.3	1.026	361.6	0.904									
19	1564.0	1.026	373.7	0.934									
20	1564.4	1.026	373.7	0.934									
21	1566.9	1.027	373.7	0.934									
22	1566.1	1.027	365.5	0.914									
23	1564.4	1.026	377.9	0.945									
24	1562.4	1.024	382.3	0.956									
25	1565.3	1.026	406.5	1.016									
26	1564.0	1.026	435.7	1.089									
27	1567.7	1.028	365.5	0.914									
28	1564.4	1.026	396.3	0.991									
29	1568.5	1.028	423.3	1.058									
30	1571.3	1.030	411.9	1.030									

Cruise: Planet Station: KWPL 192-1 date: 20 Feb 95
lat: 24-36.56 N long: 82-51.53 W depth: 25 m

calc for: 21.0 deg C 36.0 o/oo 25.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1520.1	0.997	173.1	0.433									
2	1529.6	1.003	231.3	0.578									
3	1537.6	1.008	255.1	0.638									
4	1542.7	1.012	274.9	0.687									
5	1549.7	1.016	293.0	0.733									
6	1560.0	1.023	331.6	0.829									
7	1560.8	1.023	338.1	0.845									
8	1554.9	1.020	328.5	0.821									
9	1553.3	1.018	313.8	0.784									
10	1556.8	1.021	322.4	0.806									
11	1558.4	1.022	328.5	0.821									
12	1554.5	1.019	328.5	0.821									
13	1553.7	1.019	319.5	0.799									
14	1558.0	1.022	338.1	0.845									
15	1562.0	1.024	352.0	0.880									
16	1561.6	1.024	359.5	0.899									
17	1564.4	1.026	344.9	0.862									
18	1566.4	1.027	344.9	0.862									
19	1568.4	1.028	344.9	0.862									
20	1568.4	1.028	334.8	0.837									
21	1566.8	1.027	328.5	0.821									
22	1565.6	1.027	328.5	0.821									
23	1564.8	1.026	334.8	0.837									
24	1561.2	1.024	328.5	0.821									
25	1564.8	1.026	359.5	0.899									
26	1558.0	1.022	359.5	0.899									
27	1558.4	1.022	344.9	0.862									
28	1560.8	1.023	355.7	0.889									
29	1560.8	1.023	355.7	0.889									
30	1562.4	1.024	380.2	0.950									

Cruise: Planet Station: KWPL 192-2 date: 20 Feb 95
lat: 24-36.56 N long: 82-51.53 W depth: 25 m

calc for: 21.0 deg C 36.0 o/oo 25.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1533.4	1.005	231.9	0.580	70.05	1.55	2.34	0.00	28.47	38.74	32.78	6.73	3.81
2	1539.2	1.009	250.1	0.625									
3	1542.3	1.011	261.0	0.653	63.06	1.67	1.71	0.69	37.24	31.84	30.22	6.16	3.99
4	1541.5	1.011	266.8	0.667									
5	1541.5	1.011	270.8	0.677	61.23	1.71	1.58	0.00	26.05	39.94	34.01	6.71	3.61
6	1546.6	1.014	290.4	0.726									
7	1548.2	1.015	283.6	0.709	59.57	1.74	1.47	0.07	31.86	34.92	33.15	6.58	3.89
8	1549.7	1.016	290.4	0.726									
9	1550.5	1.017	310.5	0.776	58.91	1.76	1.43	0.22	27.51	34.72	37.55	6.90	3.97
10	1547.8	1.015	297.6	0.744									
11	1549.3	1.016	295.2	0.738	59.41	1.75	1.46	0.00	31.15	35.27	33.58	6.53	3.71
12	1549.7	1.016	305.2	0.763									
13	1552.9	1.018	337.0	0.842	58.47	1.76	1.41	0.46	32.51	32.38	34.65	6.60	3.81
14	1556.8	1.021	354.1	0.885									
15	1558.8	1.022	340.2	0.851	57.07	1.79	1.33	1.23	34.88	32.69	31.20	6.50	3.90
16	1563.6	1.025	357.8	0.895									
17	1564.0	1.026	347.0	0.868	55.08	1.82	1.23	0.14	27.88	36.94	35.04	6.75	3.85
18	1562.0	1.024	333.8	0.834									
19	1563.2	1.025	340.2	0.851	54.86	1.83	1.22	0.00	27.66	36.45	35.90	6.70	3.86
20	1561.2	1.024	337.0	0.842									
21	1562.8	1.025	340.2	0.851	54.16	1.84	1.18	0.00	29.61	37.50	32.89	6.52	3.78
22	1567.6	1.028	327.6	0.819									
23	1568.0	1.028	330.6	0.827	54.26	1.84	1.19	0.68	31.00	34.82	33.50	6.59	3.90
24	1564.4	1.026	340.2	0.851									
25	1562.0	1.024	347.0	0.868	54.50	1.83	1.20						
26	1562.8	1.025	361.6	0.904									
27	1563.2	1.025	343.6	0.859	54.16	1.84	1.18						
28	1557.6	1.021	327.6	0.819									
29	1558.8	1.022	340.2	0.851	53.14	1.87	1.13						
30	1560.8	1.023	354.1	0.885									
31	1560.0	1.023	340.2	0.851	53.85	1.85	1.17						
32	1562.8	1.025	373.7	0.934									

Cruise: Planet   Station: KWPL 198-1   date: 21 Feb 95
lat: 24-36.70 N   long: 82-50.71 W   depth: 27 m

calc for: 21.0 deg C 36.0 o/oo 27.0 m 400 kHz
ref core: 20.0 deg C 82.17 delta-t 469.0 H 0.001 V/D
smp core: 36.0 o/oo 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1532.7	1.005	233.5	0.584	70.98	1.53	2.45	0.00	31.00	34.25	34.75	6.75	4.18
2	1537.3	1.008	250.1	0.625									
3	1539.6	1.010	261.0	0.653	65.15	1.64	1.87	0.05	32.16	37.87	29.91	6.45	3.72
4	1544.7	1.013	283.6	0.709									
5	1547.8	1.015	285.8	0.715	61.57	1.70	1.60	0.00	32.65	39.60	27.76	6.48	3.73
6	1549.0	1.016	297.6	0.744									
7	1551.3	1.017	318.8	0.797	60.55	1.72	1.53	0.14	24.22	42.97	32.66	6.74	3.57
8	1551.3	1.017	321.6	0.804									
9	1551.3	1.017	321.6	0.804	59.95	1.74	1.50	0.10	27.15	42.00	30.75	6.67	3.60
10	1552.9	1.018	310.5	0.776									
11	1554.5	1.019	327.6	0.819	57.88	1.78	1.37	0.15	28.38	38.88	32.59	6.54	3.56
12	1552.5	1.018	315.9	0.790									
13	1554.5	1.019	318.8	0.797	58.66	1.76	1.42	0.14	23.10	42.66	34.09	6.79	3.54
14	1554.1	1.019	340.2	0.851									
15	1554.5	1.019	340.2	0.851	56.84	1.79	1.32	0.03	27.73	36.95	35.29	6.67	3.67
16	1554.1	1.019	340.2	0.851									
17	1555.7	1.020	357.8	0.895	56.72	1.80	1.31	0.36	35.35	34.18	30.11	6.50	3.86
18	1557.3	1.021	373.7	0.934									
19	1550.9	1.017	350.5	0.876	56.58	1.80	1.30	0.65	34.63	32.96	31.76	6.28	3.94
20	1549.8	1.016	347.0	0.868									
21	1554.9	1.020	361.6	0.904	56.46	1.80	1.30	0.16	35.37	32.44	32.03	6.43	3.93
22	1557.3	1.021	361.6	0.904									
23	1556.5	1.021	369.5	0.924	55.32	1.82	1.24	2.81	32.98	32.12	32.08	6.41	4.10
24	1556.9	1.021	382.3	0.956									
25	1555.7	1.020	377.9	0.945	55.49	1.82	1.25	0.45	29.36	40.28	29.91	6.55	3.82
26	1557.3	1.021	373.7	0.934									
27	1557.7	1.021	386.8	0.967	55.96	1.81	1.27	0.84	33.47	34.22	31.47	6.36	3.80
28	1564.0	1.026	417.5	1.044									
29	1566.9	1.027	382.3	0.956	54.37	1.85	1.19	2.33	36.23	33.52	27.91	6.10	3.92
30	1564.0	1.026	401.3	1.003									
31	1562.8	1.025	391.5	0.979	54.40	1.85	1.19	0.70	27.07	33.37	38.86	6.78	3.72
32	1565.7	1.027	411.9	1.030									

Cruise: Planet Station: KWPL 198-2 date: 21 Feb 95
lat: 24-36.70 N long: 82-50.71 W depth: 27 m

calc for: 21.0 deg C 36.0 o/oo 27.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1523.5	0.999	214.5	0.536									
2	1535.4	1.007	251.8	0.630									
3	1540.0	1.010	261.0	0.653									
4	1543.9	1.012	285.8	0.715									
5	1552.5	1.018	327.6	0.819									
6	1557.3	1.021	343.6	0.859									
7	1554.9	1.020	333.8	0.834									
8	1552.9	1.018	343.6	0.859									
9	1556.5	1.021	350.5	0.876									
10	1558.1	1.022	357.8	0.895									
11	1554.1	1.019	337.0	0.842									
12	1550.9	1.017	347.0	0.868									
13	1552.9	1.018	330.6	0.827									
14	1555.3	1.020	337.0	0.842									
15	1553.7	1.019	357.8	0.895									
16	1549.4	1.016	327.6	0.819									
17	1556.5	1.021	350.5	0.876									
18	1553.7	1.019	350.5	0.876									
19	1549.4	1.016	324.6	0.811									
20	1552.9	1.018	365.5	0.914									
21	1559.3	1.022	386.8	0.967									
22	1563.2	1.025	401.3	1.003									
23	1560.9	1.023	365.5	0.914									
24	1563.6	1.025	354.1	0.885									
25	1564.8	1.026	386.8	0.967									
26	1568.9	1.029	369.5	0.924									
27	1564.0	1.026	391.5	0.979									
28	1562.4	1.024	396.3	0.991									
29	1566.1	1.027	401.3	1.003									
30	1567.7	1.028	396.3	0.991									

Cruise: Planet Station: KWPL 208-1 date: 22 Feb 95
lat: 24-44.98 N long: 82-12.09 W depth: 22 m

calc for: 20.0 deg C 36.0 o/oo 22.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1548.6	1.017	278.2	0.696	63.68	1.66	1.75	0.00	25.96	38.26	35.78	6.61	3.80
2	1543.8	1.014	241.9	0.605									
3	1543.1	1.014	245.5	0.614	61.05	1.70	1.57	0.21	31.44	39.15	29.21	6.38	3.86
4	1546.6	1.016	260.9	0.652									
5	1553.7	1.021	295.3	0.738	58.83	1.74	1.43	0.28	24.18	37.84	37.70	6.72	3.67
6	1552.5	1.020	306.0	0.765									
7	1552.1	1.020	311.7	0.779	51.35	1.87	1.06	0.18	26.74	42.20	30.87	6.64	3.88
8	1551.7	1.019	300.6	0.751									
9	1550.1	1.018	297.9	0.745	58.99	1.74	1.44	0.39	22.14	43.98	33.49	6.77	3.73
10	1546.6	1.016	297.9	0.745									
11	1543.4	1.014	308.9	0.772	58.29	1.75	1.40	1.08	25.17	37.70	36.05	6.63	3.84
12	1552.1	1.020	333.7	0.834									
13	1556.5	1.022	333.7	0.834	57.07	1.77	1.33	1.37	24.61	38.55	35.47	6.53	4.03
14	1554.9	1.021	317.7	0.794									
15	1551.3	1.019	363.8	0.909	58.20	1.75	1.39	4.37	28.48	35.83	31.32	6.05	4.35
16	1553.7	1.021	402.0	1.005									
17	1551.7	1.019	363.8	0.909	54.80	1.81	1.21	4.67	22.21	38.99	34.13	6.55	4.17
18	1553.3	1.020	344.2	0.861									
19	1549.0	1.017	311.7	0.779	55.61	1.79	1.25	6.06	27.40	31.92	34.62	5.84	4.51

Cruise: Planet   Station: KWPL 208-2   date: 22 Feb 95
lat: 24-44.98 N   long: 82-12.09 W   depth: 22 m

calc for: 20.0 deg C   36.0 o/oo   22.0 m   400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1542.0	1.013	253.2	0.633									
2	1557.8	1.023	341.1	0.853									
3	1555.4	1.022	324.7	0.812									
4	1550.2	1.018	284.6	0.711									
5	1553.0	1.020	296.7	0.742									
6	1554.2	1.021	301.9	0.755									
7	1550.6	1.019	289.3	0.723									
8	1551.0	1.019	284.6	0.711									
9	1553.8	1.021	312.9	0.782									
10	1553.0	1.020	331.1	0.828									
11	1555.4	1.022	341.1	0.853									
12	1557.4	1.023	355.7	0.889									
13	1557.4	1.023	351.9	0.880									
14	1558.6	1.024	376.4	0.941									
15	1553.8	1.021	429.8	1.074									
16	1548.6	1.017	411.6	1.029									
17	1545.9	1.015	484.3	1.211									
18	1547.5	1.016	494.1	1.235									

Cruise: Planet   Station: KWPL 215-1   date: 22 Feb 95
lat: 24-36.70 N   long: 82-50.71 W   depth: 27 m

calc for: 21.0 deg C 36.0 o/oo   27.0 m   400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1544.4	1.013	304.6	0.761	64.49	1.66	1.82	0.12	38.84	32.14	28.90	6.03	3.79
2	1550.3	1.016	324.7	0.812									
3	1557.0	1.021	351.9	0.880	60.35	1.74	1.52	0.00	44.89	28.12	27.00	5.96	3.97
4	1559.4	1.022	380.9	0.952									
5	1556.6	1.021	390.4	0.976	57.94	1.78	1.38	0.98	61.06	17.89	20.07	4.92	4.04
6	1556.6	1.021	385.6	0.964									
7	1554.6	1.019	406.0	1.015	60.86	1.73	1.55	0.00	45.52	27.88	26.60	5.94	3.80
8	1551.8	1.018	417.4	1.043									
9	1555.0	1.020	400.6	1.002	57.25	1.80	1.34	0.34	45.88	25.90	27.87	5.65	4.10
10	1559.4	1.022	376.4	0.941									
11	1555.4	1.020	376.4	0.941	55.71	1.82	1.26	0.00	36.44	30.59	32.97	6.14	3.86
12	1554.2	1.019	376.4	0.941									
13	1554.6	1.019	367.8	0.919	56.83	1.80	1.32	0.33	31.82	30.63	37.22	6.52	3.89
14	1557.4	1.021	363.7	0.909									
15	1556.6	1.021	367.8	0.919	55.24	1.83	1.23	0.32	27.58	20.14	51.96	7.81	3.76
16	1560.6	1.023	395.4	0.989									
17	1561.4	1.024	395.4	0.989	53.43	1.86	1.15	0.15	35.69	30.53	33.63	6.25	3.82
18	1559.0	1.022	367.8	0.919									
19	1557.8	1.021	359.6	0.899	53.93	1.85	1.17	1.05	35.81	19.28	43.86	6.78	3.80
20	1559.0	1.022	376.4	0.941									
21	1555.0	1.020	376.4	0.941	56.24	1.81	1.29	0.34	40.29	31.03	28.34	6.16	3.77

Cruise: Planet Station:KWPL 219 date: 23 Feb 95
lat: 24-32.48 N long: 82-29.32 W depth: 14 m

calc for: 21.0 deg C 36.0 o/oo 14.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1716.6	1.126	316.8	0.792	41.25	2.07	0.70	0.98	97.7	0.46	0.85	1.05	0.68
2	1710.8	1.122	221.1	0.553									
3	1711.2	1.122	280.3	0.701	40.85	2.07	0.69	1.82	96.49	0.62	1.07	1.14	0.71
4	1731.2	1.135	280.3	0.701									
5	1731.7	1.136	202.6	0.507	40.32	2.08	0.68	2.65	96.22	0.28	0.84	0.91	0.68
6	1731.7	1.136	228.9	0.572									
7	1715.1	1.125	233.7	0.584	41.38	2.06	0.71	2.50	96.03	0.55	0.93	1.07	0.70
8	1733.7	1.137	200.0	0.500									
9	1740.1	1.141	141.8	0.355	39.86	2.09	0.66	0.41	98.23	0.45	0.92	1.18	0.53
10	1755.7	1.151	154.5	0.386									
11	1759.2	1.154	103.3	0.258	39.65	2.09	0.66	0.14	98.86	0.21	0.79	1.24	0.43
12	1750.1	1.148	117.9	0.295									
13	1739.1	1.140	130.2	0.325	40.69	2.08	0.69	0.04	98.62	0.37	0.97	1.20	0.44
14	1733.2	1.137	117.9	0.295									
15	1732.7	1.136	117.9	0.295	41.56	2.06	0.71	0.08	98.29	0.68	0.95	1.25	0.47
16	1726.8	1.132	143.6	0.359									
17	1720.4	1.128	180.5	0.451	43.17	2.03	0.76	0.65	97.88	0.42	1.05	1.25	0.52
18	1695.5	1.112	263.0	0.658									
19	1702.6	1.117	297.4	0.743	45.13	2.00	0.82	1.45	96.59	0.77	1.19	1.28	0.61
20	1720.0	1.128	212.3	0.531									
21	1726.3	1.132	205.3	0.513	42.23	2.04	0.73	1.46	97.04	0.42	1.08	1.11	0.57
22	1731.7	1.136	244.0	0.610									

Cruise: Planet   Station: KWPL 221   date: 23 Feb 95
lat: 24-32.35 N   long: 82-29.36 W   depth: 17 m

calc for: 21.0 deg C   36.0 o/oo   17.0 m   400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1645.4	1.079	355.7	0.889	45.05	2.01	0.82	2.73	93.65	1.51	2.10	1.31	0.85
2	1683.6	1.104	251.4	0.628									
3	1689.2	1.108	271.2	0.678	43.30	2.03	0.76	3.83	94.09	0.66	1.41	1.21	0.87
4	1686.4	1.106	372.0	0.930									
5	1705.3	1.118	334.3	0.836	42.07	2.05	0.73	6.81	91.23	0.85	1.12	1.14	1.04
6	1682.2	1.103	341.1	0.853									
7	1657.5	1.087	400.6	1.002	44.00	2.02	0.79	4.19	93.74	0.65	1.41	1.10	0.94
8	1728.5	1.133	614.8	1.537									
9	1712.0	1.123	348.2	0.871	42.59	2.04	0.74	3.70	94.09	0.75	1.45	1.22	0.90
10	1712.0	1.123	385.6	0.964									
11	1707.2	1.120	265.0	0.662	45.10	2.00	0.82	2.53	95.28	0.57	1.62	1.47	0.80
12	1704.3	1.118	260.9	0.652									
13	1712.0	1.123	240.7	0.602	43.83	2.02	0.78	2.08	95.58	0.76	1.58	1.43	0.78
14	1712.5	1.123	240.7	0.602									

Cruise: Planet Station: KWPL 223 date: 23 Feb 95
lat: 24-36.70 N long: 82-50.71 W depth: 27 m

calc for: 21.0 deg C 36.0 o/oo 27.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1523.0	0.999	201.2	0.503	72.46	1.51	2.63	0.00	20.94	34.96	44.10	7.53	3.83
2	1526.8	1.001	223.4	0.558									
3	1532.6	1.005	251.4	0.629	66.76	1.61	2.01	0.00	22.04	39.55	38.41	7.04	3.62
4	1538.0	1.008	275.2	0.688									
5	1545.0	1.013	309.2	0.773	63.32	1.67	1.73	0.00	30.80	38.01	31.18	6.74	3.87
6	1550.9	1.017	323.6	0.809									
7	1551.7	1.017	326.6	0.817	59.66	1.74	1.48	0.00	27.96	37.31	34.73	6.75	3.83
8	1549.3	1.016	317.6	0.794									
9	1551.3	1.017	336.2	0.841	59.62	1.74	1.48	0.08	23.98	37.52	38.41	7.07	3.82
10	1553.3	1.018	343.0	0.858									
11	1549.3	1.016	326.6	0.817	58.27	1.77	1.40	0.00	27.13	37.92	34.95	6.69	3.66
12	1546.2	1.014	323.6	0.809									
13	1548.9	1.016	339.6	0.849	58.76	1.76	1.43	0.11	27.51	42.96	29.42	6.69	3.72
14	1552.1	1.018	369.7	0.924									
15	1553.3	1.018	353.8	0.885	59.29	1.75	1.46	1.16	32.18	42.18	24.49	6.37	3.93
16	1558.1	1.022	343.0	0.858									
17	1556.5	1.021	361.5	0.904	56.93	1.79	1.32	0.21	26.56	34.98	38.24	6.81	3.87
18	1554.1	1.019	365.5	0.914									
19	1548.2	1.015	343.0	0.858	58.90	1.76	1.43	0.00	25.99	36.24	37.77	6.95	3.87
20	1549.7	1.016	369.7	0.924									
21	1555.7	1.020	339.6	0.849	55.18	1.82	1.23	0.08	26.74	34.28	38.90	6.97	3.82
22	1559.7	1.023	323.6	0.809									
23	1558.5	1.022	339.6	0.849	55.51	1.82	1.25	0.21	26.77	41.91	31.12	6.73	3.85
24	1556.1	1.020	361.5	0.904									
25	1554.9	1.020	346.5	0.866	56.63	1.80	1.31	1.70	24.46	35.80	38.05	6.93	3.93
26	1554.1	1.019	346.5	0.866									
27	1552.5	1.018	353.8	0.885	55.56	1.82	1.25	0.11	28.51	34.76	36.61	6.73	3.89
28	1554.5	1.019	369.7	0.924									
29	1563.7	1.025	397.3	0.993	54.62	1.84	1.20	0.16	26.56	41.22	32.06	6.81	3.80
30	1569.3	1.029	402.5	1.006									
31	1570.5	1.030	407.9	1.020	53.04	1.87	1.13	0.00	27.06	34.33	38.61	6.87	3.82

Cruise: Planet   Station: KWPL 228   date: 23 Feb 95
lat: 24-36.70 N   long: 82-50.71 W   depth: 27 m

calc for: 21.0 deg C   36.0 o/oo   27.0 m   400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1528.7	1.002	211.3	0.528	72.00	1.52	2.57						
2	1530.6	1.004	223.0	0.557									
3	1538.4	1.009	271.2	0.678	64.64	1.65	1.83						
4	1545.0	1.013	304.6	0.761									
5	1550.1	1.016	331.1	0.828	59.25	1.74	1.45						
6	1553.3	1.018	334.3	0.836									
7	1552.1	1.018	337.7	0.844	58.27	1.76	1.40						
8	1552.9	1.018	324.7	0.812									
9	1551.3	1.017	324.7	0.812	59.14	1.75	1.45						
10	1550.1	1.016	337.7	0.844									
11	1552.1	1.018	351.9	0.880	59.17	1.75	1.45						
12	1550.5	1.017	344.6	0.862									
13	1550.1	1.016	327.9	0.820	56.46	1.80	1.30						
14	1551.7	1.017	348.2	0.871									
15	1553.3	1.018	390.4	0.976	57.58	1.78	1.36						
16	1548.9	1.016	372.0	0.930									
17	1547.8	1.015	359.6	0.899	59.31	1.75	1.46						
18	1553.7	1.019	380.9	0.952									
19	1552.9	1.018	372.0	0.930	55.43	1.82	1.24						
20	1553.3	1.018	367.8	0.919									
21	1554.5	1.019	337.7	0.844	56.65	1.80	1.31						
22	1552.9	1.018	337.7	0.844									
23	1552.5	1.018	367.8	0.919	55.91	1.81	1.27						

Cruise: Planet **Station: KWPL 244-1** **date: 24 Feb 95**
lat: 24-36.70 N **long: 82-50.71 W** **depth: 27 m**

calc for: 21.0 deg C 36.0 o/oo 27.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1528.1	1.002	207.8	0.519	69.75	1.55	2.31	0.00	14.99	40.96	44.05	7.54	3.54
2	1531.9	1.004	229.5	0.574									
3	1535.4	1.007	246.1	0.615	65.92	1.62	1.93	0.00	33.43	40.89	25.68	6.21	3.47
4	1542.4	1.011	291.2	0.728									
5	1553.4	1.019	329.8	0.824	61.86	1.70	1.62	0.00	28.62	41.20	30.19	6.54	3.80
6	1552.2	1.018	314.8	0.787									
7	1551.0	1.017	314.8	0.787	59.89	1.74	1.49	0.00	22.33	37.01	40.66	7.00	3.53
8	1551.0	1.017	317.6	0.794									
9	1553.0	1.018	323.6	0.809	59.06	1.75	1.44	0.12	25.77	39.46	34.64	6.73	3.63
10	1551.8	1.018	323.6	0.809									
11	1551.8	1.018	323.6	0.809	58.52	1.76	1.41	0.18	23.23	44.48	32.10	6.77	3.60
12	1550.7	1.017	361.5	0.904									
13	1547.9	1.015	382.8	0.957	58.22	1.77	1.39	0.34	27.21	39.29	33.16	6.68	3.65
14	1552.2	1.018	346.5	0.866									
15	1547.5	1.015	326.6	0.817	59.43	1.75	1.46	0.12	21.30	39.58	38.99	7.07	3.56
16	1545.1	1.013	317.6	0.794									
17	1542.8	1.012	303.8	0.759	58.71	1.76	1.42	0.00	23.98	42.35	33.68	6.86	3.58
18	1550.3	1.016	329.8	0.824									
19	1560.2	1.023	339.6	0.849	54.69	1.83	1.21	0.01	20.09	40.03	39.87	7.11	3.51
20	1560.2	1.023	339.6	0.849									
21	1559.4	1.022	353.8	0.885	54.44	1.84	1.19	0.00	21.86	38.61	39.52	7.05	3.56
22	1555.0	1.020	346.5	0.866									
23	1550.3	1.016	369.7	0.924	55.56	1.82	1.25	0.00	25.20	41.09	33.70	6.74	3.61
24	1553.8	1.019	373.9	0.935									
25	1559.0	1.022	369.7	0.924	54.80	1.83	1.21	0.42	26.24	35.04	38.30	6.82	3.77
26	1559.0	1.022	369.7	0.924									
27	1560.6	1.023	361.5	0.904	55.27	1.83	1.24	0.38	32.16	35.43	32.03	6.48	3.72
28	1565.4	1.026	357.6	0.894									
29	1567.8	1.028	402.5	1.006	53.98	1.85	1.17						
30	1565.4	1.026	392.3	0.981									
31	1563.4	1.025	373.9	0.935	54.33	1.85	1.19						
32	1563.8	1.025	397.3	0.993									

Cruise: Planet Station: KWPL 244-2 date: 24 Feb 95
lat: 24-36.70 N long: 82-50.71 W depth: 27 m

calc for: 21.0 deg C 36.0 o/oo 27.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1522.7	0.998	205.1	0.513	72.92	1.50	2.69	0.00	22.85	35.24	41.91	7.31	3.81
2	1528.1	1.002	232.6	0.582									
3	1532.3	1.005	246.1	0.615	66.05	1.62	1.95	0.00	22.60	37.54	39.85	7.10	3.66
4	1538.1	1.009	268.9	0.672									
5	1543.2	1.012	291.2	0.728	62.46	1.69	1.66	0.00	22.63	42.29	35.08	6.84	3.54
6	1546.7	1.014	309.2	0.773									
7	1548.3	1.015	314.8	0.787	60.40	1.73	1.53	0.05	25.42	38.92	35.62	6.73	3.68
8	1550.3	1.016	326.6	0.817									
9	1547.5	1.015	309.2	0.773	59.03	1.75	1.44	0.08	30.74	37.69	31.49	6.73	3.98
10	1551.0	1.017	317.6	0.794									
11	1553.8	1.019	323.6	0.809	57.53	1.78	1.35	0.12	23.24	40.43	36.21	6.90	3.62
12	1552.6	1.018	323.6	0.809									
13	1551.4	1.017	333.0	0.832	59.64	1.74	1.48	0.24	28.27	34.57	36.92	6.73	3.78
14	1551.8	1.018	361.5	0.904									
15	1553.0	1.018	353.8	0.885	57.81	1.78	1.37	0.32	28.43	33.62	37.63	6.80	3.90
16	1553.0	1.018	357.6	0.894									
17	1551.8	1.018	365.5	0.914	56.98	1.79	1.32	0.33	29.19	37.31	33.18	6.46	3.65
18	1553.4	1.019	365.5	0.914									
19	1552.2	1.018	382.8	0.957	57.70	1.78	1.36	0.21	27.17	34.71	37.91	6.87	3.82
20	1547.9	1.015	378.3	0.946									
21	1547.1	1.014	365.5	0.914	57.09	1.79	1.33	0.67	27.60	34.14	37.60	6.62	3.82
22	1548.3	1.015	378.3	0.946									
23	1551.8	1.018	369.7	0.924	56.42	1.80	1.29	0.93	29.73	31.59	37.75	6.58	4.06
24	1553.4	1.019	382.8	0.957									
25	1551.8	1.018	378.3	0.946	56.97	1.79	1.32	0.95	38.15	30.47	30.43	6.31	4.16
26	1551.8	1.018	361.5	0.904									
27	1553.0	1.018	369.7	0.924	46.30	1.98	0.86	0.38	27.52	34.61	37.49	6.64	3.84
28	1551.4	1.017	373.9	0.935									
29	1547.9	1.015	365.5	0.914	56.97	1.80	1.32	0.86	37.57	28.41	33.17	6.36	4.17
30	1553.8	1.019	392.3	0.981									

Cruise: Planet Station:KWPL 263 date: 25 Feb 95
lat: 24-35.97 N long: 82-49.00 W depth: 24 m

calc for: 21.0 deg C 36.0 o/oo 24.0 m 400 kHz

smp core: 6.1 cm thickness

Depth (cm)	V_p (m/s)	V_p Ratio	Alpha (dB/m)	k	Porosity %	Density (g/cm^3)	e	% Gr	% Sand	% Silt	% Clay	MGS (phi)	Sorting (phi)
1	1651.0	1.083	287.9	0.720	45.81	1.99	0.85	0.90	91.11	5.26	2.73	1.00	1.33
2	1659.1	1.088	314.8	0.787									
3	1668.2	1.094	306.2	0.765	44.89	2.00	0.81	0.90	94.03	1.72	3.35	1.05	0.98
4	1674.6	1.098	261.1	0.653									
5	1679.3	1.101	265.2	0.663	44.65	2.01	0.81	0.66	93.90	3.39	2.05	1.10	1.06
6	1680.2	1.102	271.7	0.679									
7	1679.3	1.101	263.2	0.658	45.55	2.00	0.84	0.80	91.18	3.90	4.13	1.35	1.51
8	1677.4	1.100	283.1	0.708									
9	1675.6	1.099	303.4	0.759	44.67	2.01	0.81	1.07	91.55	3.29	4.09	1.15	1.49
10	1674.6	1.098	344.4	0.861									
11	1669.1	1.094	413.5	1.034	46.47	1.99	0.87	2.10	89.89	3.48	4.54	1.08	1.62
12	1669.1	1.094	512.2	1.281									

KWPL118-1
14 Feb 95 24-36.81 N 82-50.90 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in^2)	Shear Strength (g/cm^2)	Shear Strength (kPa)
1	0.04	2.47	0.24
2	0.07	4.95	0.49
3	0.12	8.25	0.81

KWPL118-2
14 Feb 95 24-36.81 N 82-50.90 W 25 m

DIVER VANE SHEAR
Vane Width= 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in^2)	Shear Strength (g/cm^2)	Shear Strength (kPa)
1	0.02	1.65	0.16
2	0.13	9.07	0.89

KWPL118-3
14 Feb 95 24-36.81 N 82-50.90 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in^2)	Shear Strength (g/cm^2)	Shear Strength (kPa)
1	0.07	4.95	0.49
2	0.08	5.77	0.57

KWPL118-4
14 Feb 95 24-36.81 N 82-50.90 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in^2)	Shear Strength (g/cm^2)	Shear Strength (kPa)
1	0.07	4.95	0.49

KWPL118-5
14 Feb 95 24-36.81 N 82-50.90 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in^2)	Shear Strength (g/cm^2)	Shear Strength (kPa)
1	0.05	3.3	0.32
2	0.09	6.6	0.65

KWPL118-6
14 Feb 95 24-36.81 N 82-50.90 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in^2)	Shear Strength (g/cm^2)	Shear Strength (kPa)
1	0.05	3.30	0.32
2	0.09	6.60	0.65
3	0.12	8.25	0.81

KWPL123-1
14 Feb 95 24-36.81 N 82-50.90 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in^2)	Shear Strength (g/cm^2)	Shear Strength (kPa)
3	0.14	9.90	0.97
4	0.28	19.79	1.94
5	0.32	22.46	2.20
6	0.41	28.87	2.83

KWPL123-2
14 Feb 95 24-36.81 N 82-50.90 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in^2)	Shear Strength (g/cm^2)	Shear Strength (kPa)
3	0.14	9.90	0.97
4	0.28	19.79	1.94
5	0.37	25.76	2.53
6	0.41	28.87	2.83
7	0.36	25.36	2.49
8	0.45	31.73	3.11
9	0.54	38.08	3.73

KWPL123-3
14 Feb 95 24-36.81 N 82-50.90 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Strength (lb/in^2)	Strength (g/cm^2)	Strength (kPa)
3	0.38	26.39	2.59
4	0.42	29.69	2.91
6	0.55	38.76	3.80
7	0.55	38.55	3.78
10	0.54	37.83	3.71

KWPL123-4
14 Feb 95 24-36.81 N 82-50.90 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in^2)	Shear Strength (g/cm^2)	Shear Strength (kPa)
3	0.19	13.19	1.29
4	0.47	32.98	3.23
5	0.46	32.36	3.17
7	0.55	38.55	3.78
8	0.55	38.32	3.76

KWPL135-1
15 Feb 95 24-36.81 N 82-50.91 W 25 m
DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in^2)	Shear Strength (g/cm^2)	Shear Strength (kPa)
7	0.64	45.15	4.43
8	0.83	58.11	5.70
9	0.54	38.08	3.73

KWPL135-2
15 Feb 95 24-36.81 N 82-50.91 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in^2)	Shear Strength (g/cm^2)	Shear Strength (kPa)
7	0.88	61.64	6.04
8	0.73	51.52	5.05
9	1.01	71.07	6.97

KWPL135-3
15 Feb 95 24-36.81 N 82-50.91 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in^2)	Shear Strength (g/cm^2)	Shear Strength (kPa)
7	0.64	45.15	4.43
8	0.83	58.11	5.70
9	0.78	54.58	5.35
10	0.87	60.92	5.97
11	1.00	70.55	6.92
12	1.05	73.57	7.21
13	1.09	76.57	7.51

KWPL135-4
15 Feb 95 24-36.81 N 82-50.91 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in^2)	Shear Strength (g/cm^2)	Shear Strength (kPa)
7	0.74	51.74	5.07
8	0.87	61.41	6.02
9	0.82	57.87	5.68

KWPL135-5
15 Feb 95 24-36.81 N 82-50.91 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in^2)	Shear Strength (g/cm^2)	Shear Strength (kPa)
7	0.45	31.95	3.13
8	0.50	35.03	3.43
9	0.73	51.28	5.03
10	0.91	64.22	6.30
11	0.86	60.65	5.95
14	0.90	63.08	6.19

KWPL150-1
17 Feb 95 24-36.78 N 82-50.95 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in^2)	Shear Strength (g/cm^2)	Shear Strength (kPa)
10	0.73	51.02	5.00
11	0.82	57.35	5.62
12	1.56	109.85	10.77
13	0.90	63.38	6.22
14	1.27	89.47	8.77
15	2.39	168.31	16.51
16	2.76	194.38	19.06
20	3.40	239.17	23.45
25	4.22	296.60	29.09
30	3.25	228.50	22.41
35	2.84	199.79	19.59
40	4.31	302.86	29.70
50	3.86	271.04	26.58

KWPL150-2
17 Feb 95 24-36.78 N 82-50.95 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in^2)	Shear Strength (g/cm^2)	Shear Strength (kPa)
10	1.66	116.99	11.47
11	1.66	116.72	11.45
12	2.03	142.83	14.01
13	1.28	89.77	8.80
14	2.40	168.63	16.54
15	1.46	102.35	10.04
16	2.95	207.57	20.36
20	2.75	192.99	18.93
25	2.15	151.47	14.85
30	3.81	268.08	26.29
35	3.59	252.57	24.77

KWPL150-3
17 Feb 95 24-36.78 N 82-50.95 W 25 m

DIVER VANE SHEAR
Vane Width = 0.86 in. Height = 0.86 in.

Depth (cm)	Shear Strength (lb/in^2)	Shear Strength (g/cm^2)	Shear Strength (kPa)
10	1.48	103.80	10.18
11	1.28	90.34	8.86
12	1.66	116.45	11.42
13	2.22	155.74	15.27
14	2.40	168.63	16.54
15	2.02	141.93	13.92
16	3.14	220.77	21.65
20	2.75	192.99	18.93
25	2.91	204.25	20.03
30	4.00	281.27	27.58
35	3.40	239.38	23.47
65	4.10	288.25	28.27

3.2 Index Properties and DIAS Measurements (Lavoie and Stephens)

Station locations are given in Figs. 3.2.1, 3.2.2, 3.2.5, and 3.2.6. Depth profiles are shown in Figs. 3.2.3 and 3.2.4. The DIAS results are tabulated in Table 3.2.1. The DIAS results have been combined into one in situ profile of measured shear modulus in the Tortugas and another profile in the Marquesas. Both profiles are plotted on Fig. 3.2.7 along with the ISSAMS and GISSAMS data for comparison. The curve marked "predicted" was calculated using Bryan and Stoll's model (1988) for predicting shear wave velocity from void ratio. All the in situ data agree well with the predicted shear wave velocity above ~80 cm. A distinct shelly layer at that depth may be responsible for scatter in the data between probes (due to coupling problems with the DIAS system). The data begin to converge just below the shelly layer.

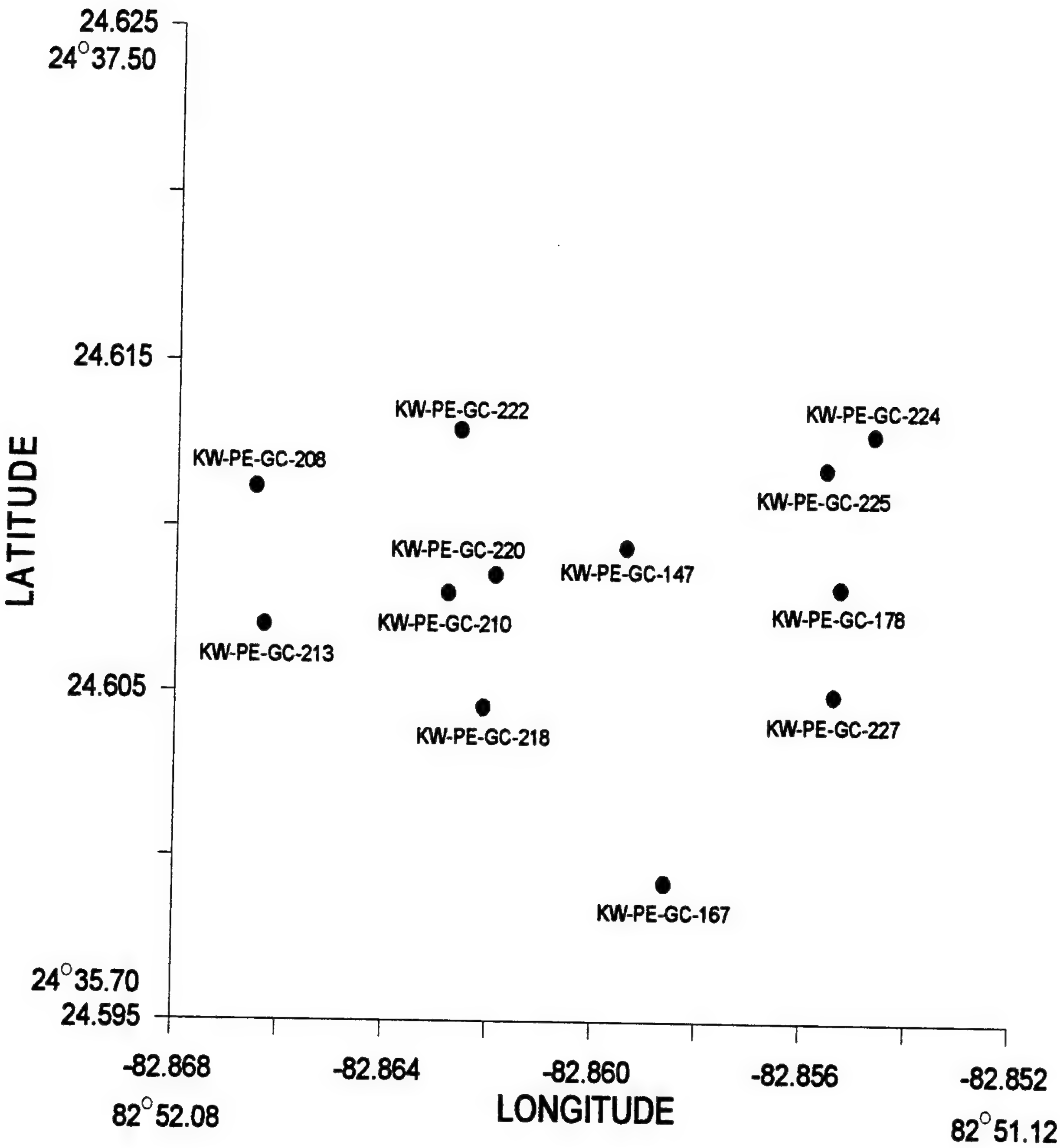


Figure 3.2.1 Dry Tortugas Test Site Gravity Core Locations

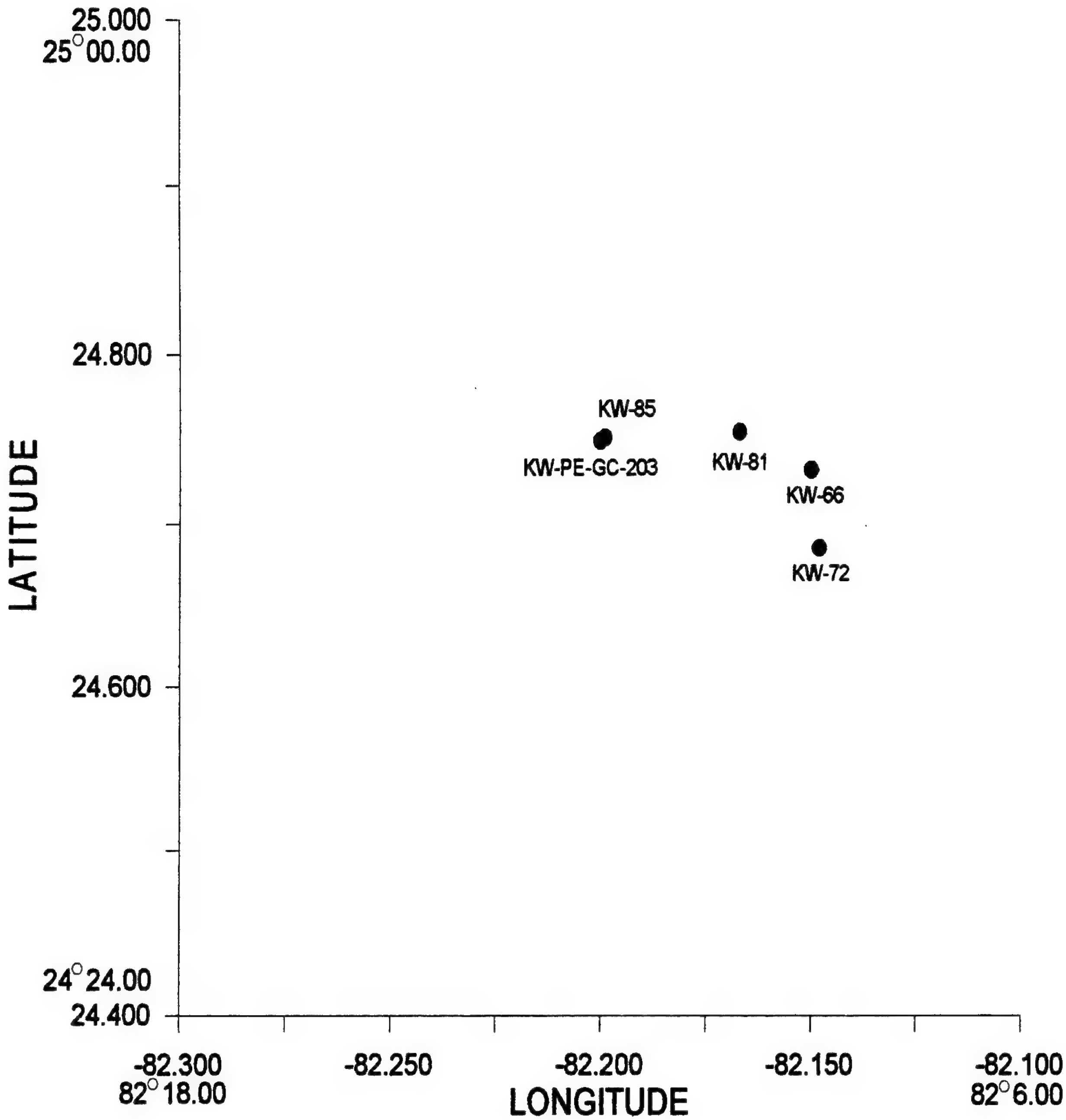


Figure 3.2.2. Marquesas Test Site Gravity Core Locations

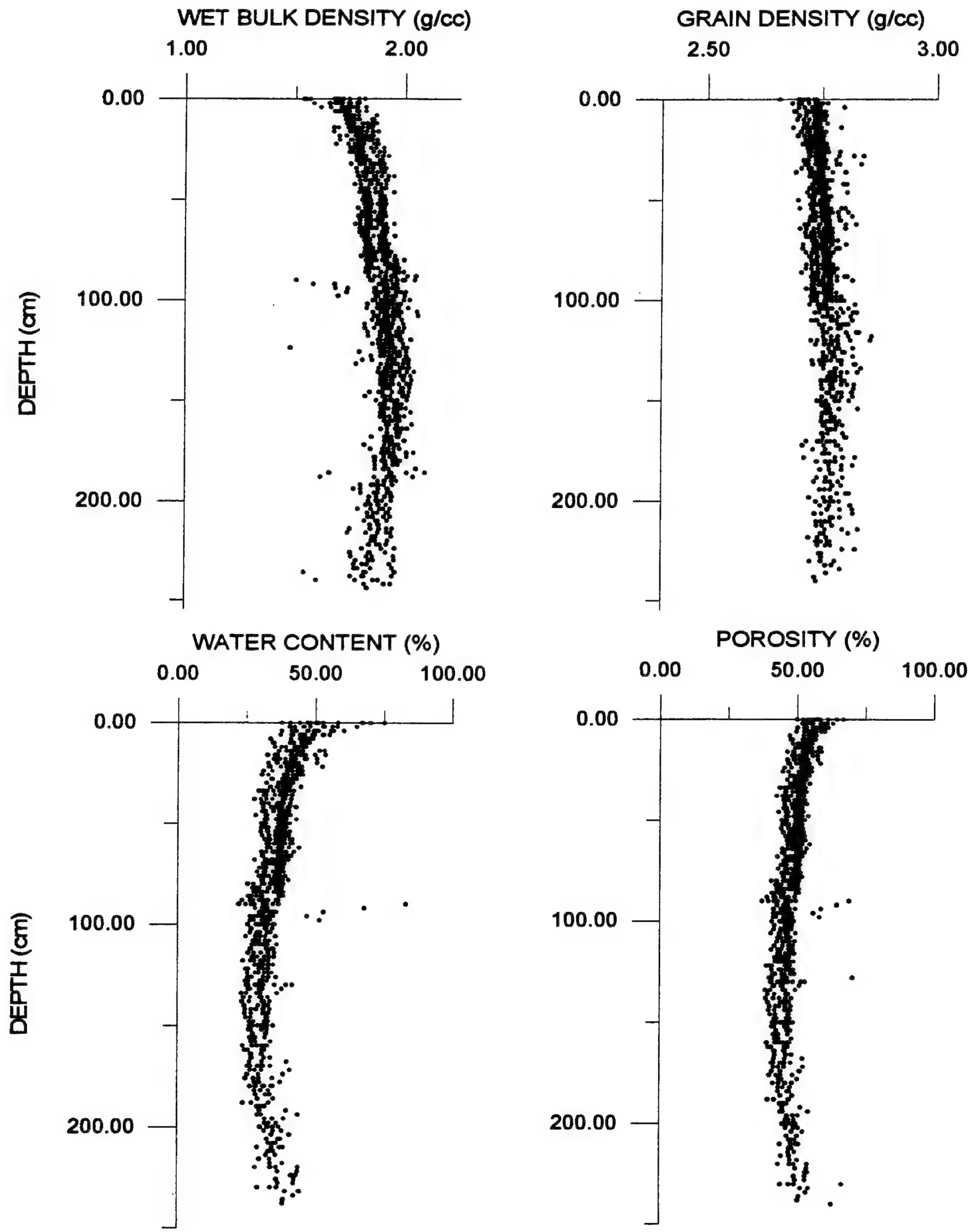


Figure 3.2.3 Depth profiles of wet bulk density, grain density, water content, and porosity

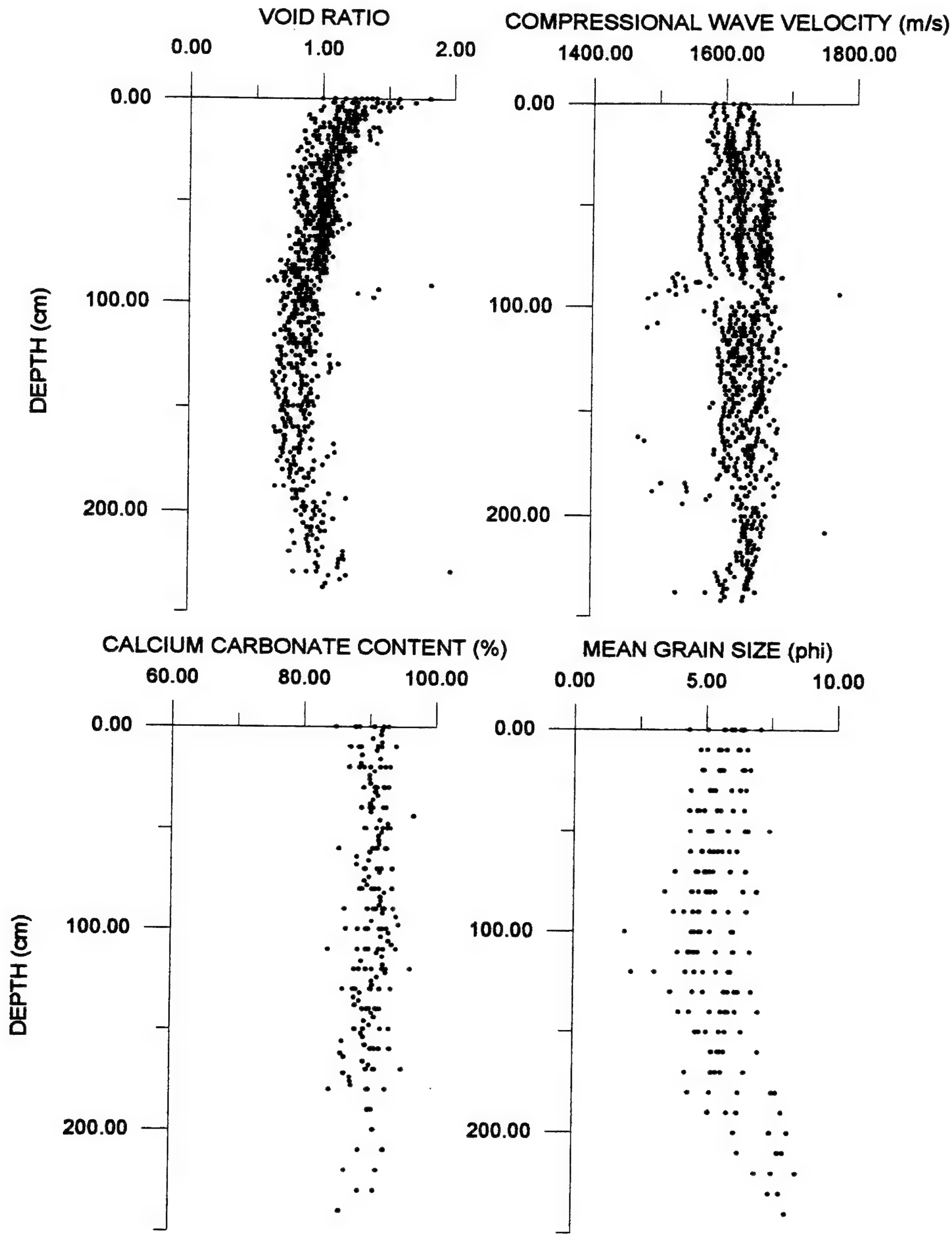


Figure 3.2.4 Depth profiles of void ratio, compressional wave velocity, calcium carbonate content, and mean grain size

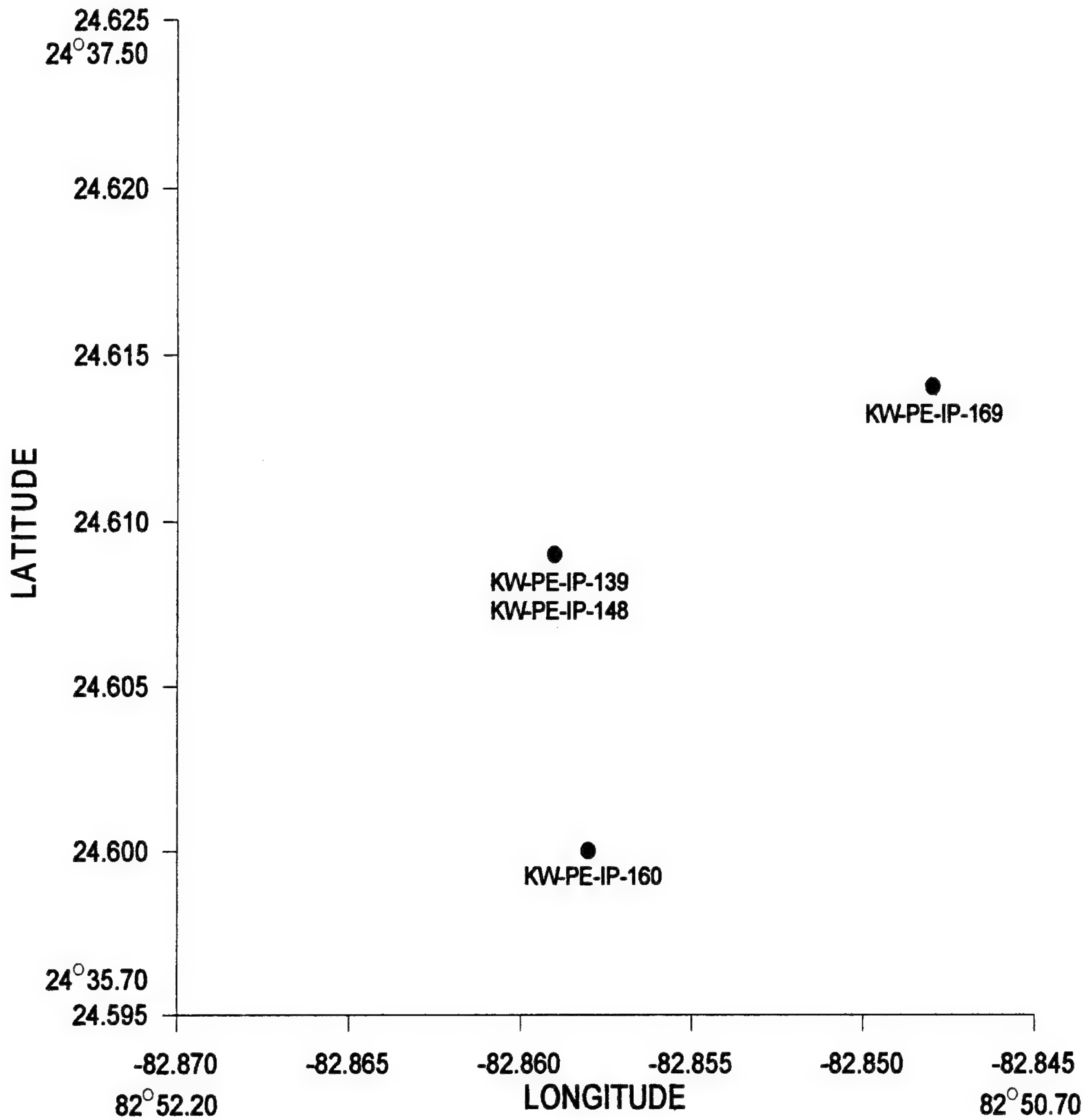


Figure 3.2.5 DryTortugas Test Site DIAS Locations

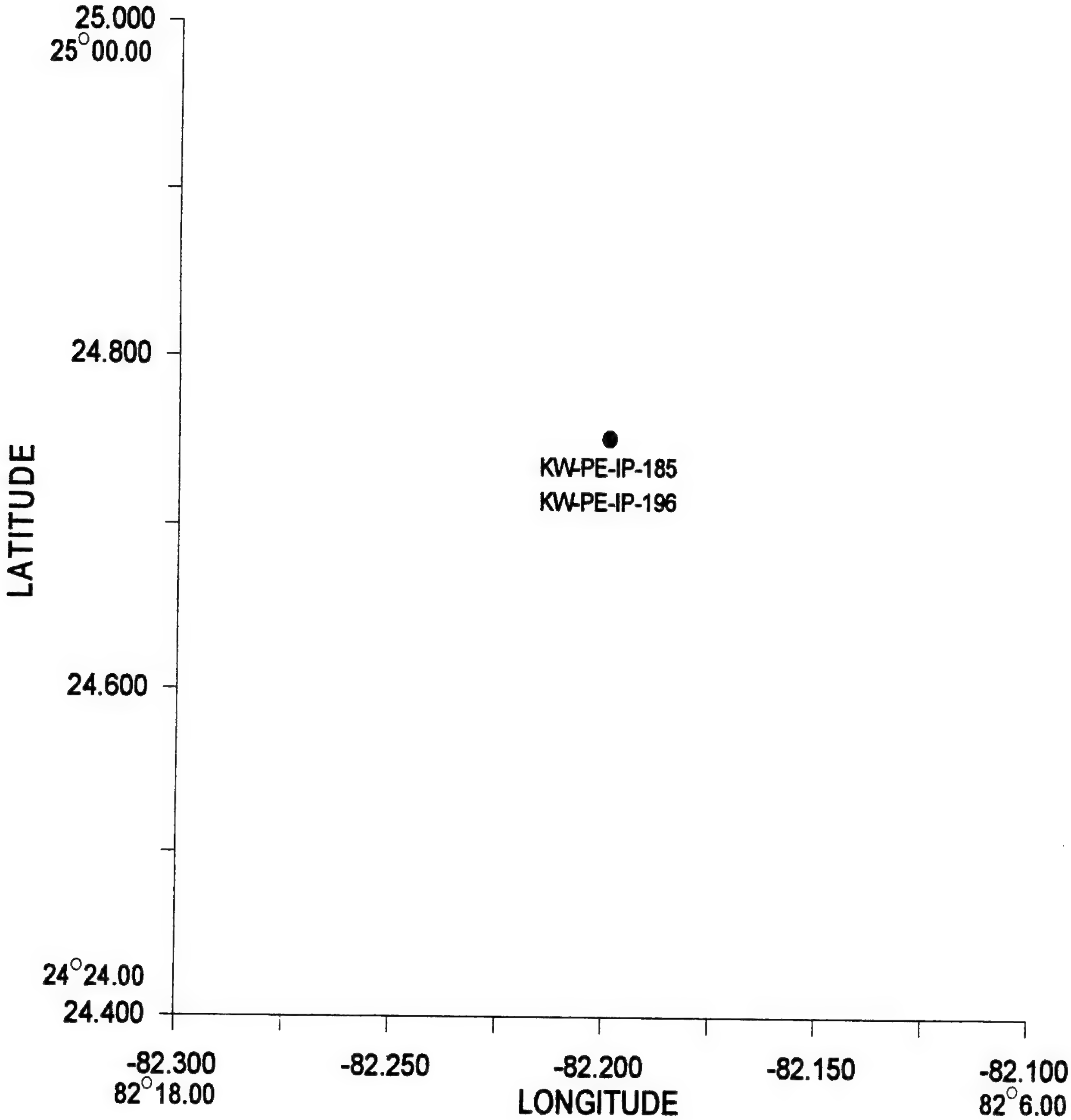


Figure 3.2.6 Marquesas Test Site DIAS Locations

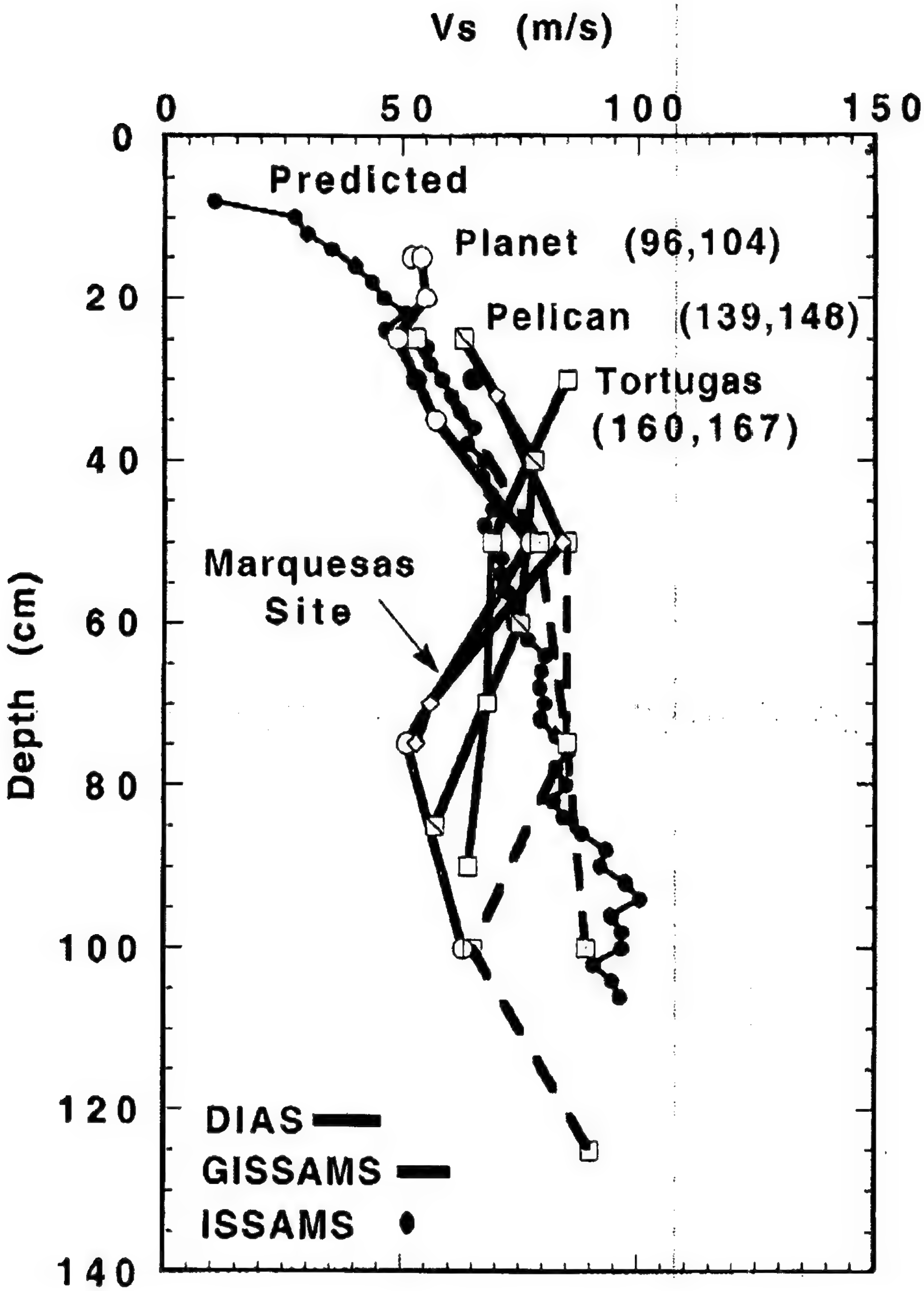


Figure 3.2.7 In-situ shear wave velocities measured at the Dry Tortugas and Marquesas sites.

308

Table 3.2.1 Key West Dias Data: FY95

SITE ID	Depth of insertion	G (N/m2)	Vs (m/s)
DRY TORTUGAS			
SITE 139	25cm	6.52E+06	63
	40cm	1.01E+07	78
SITE 148	60cm	9.18E+06	75
	85cm	5.30E+06	57
SITE 160	30cm	1.18E+07	85
	50cm	7.82E+06	69
SITE 169			
	70cm	7.53E+06	68
	90cm	6.66E+06	64
MARQUESAS			
SITE 185	30cm	8.48E+06	72
		8.48E+06	72
	50 cm	1.16E+07	84
		1.15E+07	83
	70 cm	5.14E+06	56
SITE 196	75 cm	4.65E+06	53
		4.98E+06	55
		3.03E+06	43
		3.00E+06	43

KW-66

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)
0	1.73	2.67	52.6	1.41	58.43
10	1.83	2.7	42.28	1.14	53.26
30	1.84	2.68	41.26	1.1	52.47
50	1.88	2.69	38.26	1.03	50.69
70	1.79	2.7	47.47	1.28	56.13
90	1.91	2.74	37.35	1.02	50.56
110	1.88	2.76	32.81	0.91	47.52

KW-72

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)
0	1.82	2.62	37.38	0.98	49.44
18	1.95		32.71	1.16	53.66
30	1.93	2.75	32.25	0.89	47.01
50	1.99	2.73	31.02	0.85	45.87
70	1.91	2.69	41.24	1.11	52.61
90	1.89	2.73	39.24	1.07	51.78

KW-81

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)
0	1.76	2.83	62.36	1.76	63.79
10	1.89	2.78	37.51	1.04	51.06
30	1.99	2.73	36.2	0.99	49.7
50	1.99	2.8	33.96	0.94	48.72
70	1.99	2.82	34.25	0.97	49.13
90	1.93	2.81	36.96	1.04	50.95

KW-85

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)
0	1.69	2.75	61.36	1.69	62.81
10	1.9	2.81	37.7	1.06	51.47
17	1.85	2.76	41.21	1.14	53.24
27	1.86		44.39	1.29	5627
30	1.92	2.76	38.11	1.05	51.29
50	1.9	2.78	38.92	1.08	51.93
70	1.88	2.82	42.63	1.2	54.58
90	1.84	2.85	47.19	1.35	57.37

KW-PE-GC-147

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	%Carb	Vp (m/s)
0-2	1.68	2.72	58.18	1.58	61.26	0.00	21.56	55.93	22.61	6.08	92.1	1595.65
2-4	1.68	2.70	57.99	1.57	61.04						91.8	1595.85
4-6	1.75	2.73	51.07	1.39	58.20						91.7	1595.85
6-8	1.70	2.73	55.05	1.50	60.08						90.4	1600.50
8-10	1.76	2.73	47.76	1.30	56.60						91.8	1597.59
10-12	1.76	2.75	47.92	1.32	56.86	0.08	26.39	53.63	19.90	5.80	88.4	1603.81
12-14	1.80	2.73	44.15	1.21	54.69						91.1	1603.81
14-16	1.78	2.74	45.41	1.24	55.41						88.8	1602.44
16-18	1.78	2.72	46.44	1.26	55.81						91.6	1599.33
18-20	1.79	2.74	46.16	1.26	55.83						88.7	1602.44
20-22	1.82	2.72	42.81	1.16	53.79	0.98	32.65	45.61	20.76	5.68	90.1	1600.89
22-24	1.80	2.71	43.99	1.19	54.41						90.7	1599.53
24-26	1.80	2.75	45.29	1.24	55.43						90	1598.17
26-28	1.80	2.79	44.53	1.24	55.38						90	1603.03
28-30	1.82	2.79	43.10	1.20	54.56						90.1	1603.03
30-32	1.82	2.76	41.58	1.15	53.41	2.16	40.55	38.72	18.57	5.24	90.8	1607.72
32-34	1.84	2.74	40.65	1.11	52.65						90.9	1605.96
34-36	1.85	2.76	40.57	1.12	52.83						91.2	1610.47
36-38	1.84	2.77	41.41	1.15	53.44						90.5	1612.04
38-40	1.86	2.72	38.63	1.05	51.24						90.1	1607.13
40-42	1.87	2.75	37.94	1.04	51.06	3.77	44.35	32.03	19.85	4.97	90.5	1613.23
42-44	1.87	2.75	37.97	1.04	51.07						90.2	1616.39
44-46	1.86	2.72	39.04	1.06	51.51						96.7	1617.78
46-48	1.86	2.80	39.03	1.09	52.25						91.6	1611.45
48-50	1.81	2.72	43.22	1.18	54.06						92.8	1606.74
50-52	1.84	2.75	40.83	1.12	52.89	3.71	47.84	31.37	17.07		92	1617.78
52-54	1.89	2.74	36.81	1.01	50.18						91.9	1614.61
54-56	1.89	2.80	37.08	1.04	50.93						91.4	1613.23

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	%Carb	Vp (m/s)
56-58	1.86	2.78	39.65	1.10	52.46						91.4	1619.57
58-60	1.87	2.78	37.98	1.06	51.41						91.5	1605.37
60-62	1.87	2.77	38.90	1.08	51.83	4.46	49.83	27.77	17.94		92.7	1611.85
62-64	1.88	2.76	38.14	1.05	51.30						90.1	1618.18
64-66	1.92	2.75	34.65	0.95	48.82						88.1	1616.59
66-68	1.89	2.75	36.48	1.00	50.09						89.9	1612.04
68-70	1.89	2.74	35.98	0.99	49.68						88.1	1623.16
70-72	1.91	2.77	34.81	0.97	49.12	4.13	50.15	29.60	16.12		91.9	1626.36
72-74	1.88	2.74	37.44	1.03	50.63						91.6	1621.56
74-76	1.88	2.74	37.25	1.02	50.53						90	1621.56
76-78	1.89	2.76	36.48	1.01	50.18						89.3	1627.97
78-80	1.92	2.74	34.25	0.94	48.39						89.7	1628.16
80-82	1.90	2.76	35.69	0.98	49.59	5.39	47.94	26.86	19.81		90.9	1628.16
82-84	1.93	2.74	33.31	0.91	47.72						92.3	1629.77
84-86	1.94	2.77	32.64	0.90	47.44						91.7	1628.36
86-88	1.96	2.76	30.30	0.83	45.50						91.8	1521.20
88-90	2.01	2.73	26.37	0.72	41.82	16.56	38.63	25.68	19.13		91.6	1524.57
90-92	1.96	2.77	31.18	0.86	46.30	9.71	46.58	25.17	18.54	4.21	93.7	1525.37
92-94	1.97	2.73	30.81	0.84	45.66						92.1	1516.25
94-96	1.97	2.73	29.85	0.81	44.87						94.1	1495.37
96-98	1.98	2.77	29.28	0.81	44.78						90.4	1484.13
98-100	1.95	2.77	33.08	0.92	47.81						94.5	1649.82
100-102	1.95	2.79	33.05	0.92	47.96	6.43	48.96	23.74	20.87	4.59	91.7	1628.83
102-104	1.92	2.72	34.48	0.94	48.42						93	1568.91
104-106	1.92	2.76	33.88	0.93	48.29						91.9	1646.06
106-108	1.91	2.76	35.65	0.98	49.62						93	1646.30
108-110	1.94	2.75	33.28	0.92	47.80						93.5	1498.46
110-112	1.95	2.78	32.58	0.91	47.55	10.81	42.34	24.59	22.25	4.43	94.1	1483.59
112-114	1.92	2.74	34.20	0.94	48.41						91.2	1606.36
114-116	1.94	2.75	32.91	0.91	47.52						92.1	1633.75

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	%Carb	Vp (m/s)
116-118	1.93	2.75	33.33	0.92	47.86						88.9	1642.32
118-120	1.96	2.75	31.84	0.88	46.70						92.2	1642.52
120-122	1.91	2.75	34.85	0.96	48.98	7.45	47.07	22.85	22.63	4.28	92.1	1640.88
122-124	1.93	2.76	33.26	0.92	47.82						92.6	1639.44
124-126	1.93	2.78	34.38	0.96	48.87						91.3	1629.68
126-128	1.96	2.78	33.25	0.92	48.00						90.5	1628.26
128-130	1.98	2.78	31.02	0.86	46.26						90.6	1641.28
130-132	1.95	2.75	31.44	0.86	46.33	7.89	40.57	25.86	25.68	4.96	88.1	1657.86
132-133	1.97	2.73	29.84	0.81	44.90						88.7	1658.06
133-136	1.98	2.75	30.25	0.83	45.45						87.8	1663.10
136-138	1.98	2.79	30.79	0.86	46.23						88.6	1658.06
138-140	1.93	2.77	33.59	0.93	48.20						88	1646.02
140-142	1.94	2.75	32.72	0.90	47.35	6.33	42.14	23.57	27.96	5.22	89.1	1658.57
142-144	1.93	2.75	33.58	0.92	48.00						90.5	1660.66
144-146	1.93	2.75	33.23	0.91	47.76						90.9	1654.36
146-148	1.94	2.77	32.41	0.90	47.28						89.4	1657.91
148-150	1.93	2.75	33.12	0.91	47.67						90.2	1648.12
150-152	1.94	2.75	32.93	0.90	47.50	4.80	44.54	22.38	28.28	5.79	91.9	1643.57
152-154	1.97	2.76	30.82	0.85	45.97						89	1642.12
154-156	1.96	2.83	32.44	0.92	47.86						89.3	1640.68
156-158	1.96	2.77	31.98	0.89	46.99						86.1	1634.35
158-160	1.91	2.75	34.03	0.94	48.35						89.6	1653.25
160-162	1.93	2.76	32.94	0.91	47.64	3.06	38.47	24.73	33.74	7.04	90.4	1653.45
162-164	1.97	2.78	31.72	0.88	46.89						85.9	1652.19
164-166	1.98	2.76	30.66	0.85	45.87						86.4	1650.74
166-168	1.92	2.75	34.03	0.94	48.35						89.3	1649.48
168-170	1.85	2.75	39.98	1.10	52.41						90.2	1643.49
170-172	1.93	2.72	34.00	0.92	48.02	7.82	38.10	26.13	30.94	6.51	91.1	1635.31
172-174	1.82	2.71	41.00	1.11	52.62						86.4	1622.60
174-176	1.84	2.73	38.66	1.06	51.37						87.3	1634.09

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	%Carb	Vp (m/s)
176-178	1.91	2.75	34.66	0.95	48.85						87.4	1618.01
178-180	1.86	2.71	37.51	1.02	50.43						87.5	1607.33
180-182	1.90	2.74	34.30	0.94	48.45	1.16	26.04	35.10	37.70	7.59	84.2	1617.40
MEAN	1.89	2.75	36.96	1.02	50.11	5.34	40.74	31.07	23.02	5.49	90.5	1614.6

KW-PE-GC-167

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)
0-2	1.56	2.70	67.13	1.81	64.44	0.46	29.92	48.87	20.74	5.70	1629.47
2-4	1.70	2.72	53.31	1.45	59.17						1633.81
4-6	1.73	2.71	56.59	1.53	60.52						1641.74
6-8	1.73	2.71	52.62	1.43	58.81						1640.35
8-10	1.76	2.71	49.11	1.33	57.11						1641.94
10-12	1.75	2.72	46.92	1.28	56.06	3.17	40.17	39.41	17.25	4.81	1648.35
12-14	1.86	2.71	46.30	1.26	55.69						1637.17
14-16	1.83	2.72	43.08	1.17	53.93						1643.54
16-18	1.80	2.72	49.83	1.35	57.50						1648.35
18-20	1.82	2.72	41.71	1.13	53.16						1648.54
20-22	1.85	2.72	42.26	1.15	53.49	2.28	41.03	39.50	17.19	4.89	1648.54
22-24	1.85	2.72	41.03	1.12	52.77						1648.54
24-26	1.84	2.72	40.44	1.10	52.42						1657.66
26-28	1.85	2.72	39.71	1.08	51.93						1652.79
28-30	1.92	2.72	38.12	1.04	50.93						1663.99
30-32	1.88	2.72	40.61	1.10	52.46	4.52	47.61	32.80	15.07	4.44	1665.63
32-34	1.89	2.72	38.15	1.04	50.91						1660.52
34-36	1.91	2.72	39.20	1.07	51.58						1663.6
36-38	1.87	2.73	38.59	1.05	51.26						1665.04
38-40	1.86	2.73	38.71	1.06	51.34						1668.33
40-42	1.85	2.74	41.08	1.12	52.93	3.89	48.04	32.17	15.90	4.40	1666.48
42-44	1.88	2.74	39.87	1.09	52.20						1666.29
44-46	1.89	2.73	39.13	1.07	51.65						1666.09
46-48	1.88	2.73	39.88	1.09	52.11						1660.97
48-50	1.88	2.73	39.50	1.08	51.90						1663.85
50-52	1.88	2.73	39.03	1.06	51.57	7.85	44.56	30.79	16.80	4.43	1652.05
52-54	1.87	2.73	39.59	1.08	51.94						1655.1
54-56	1.89	2.73	37.76	1.03	50.76						1661.42

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)
56-58	1.89	2.73	35.44	0.97	49.17						1661.42
58-60	1.91	2.72	36.62	1.00	49.94						1659.59
60-62	1.88	2.72	37.60	1.02	50.58	4.70	48.93	29.36	17.01	4.45	1652.89
62-64	1.95	2.72	37.19	1.01	50.28						1655.74
64-66	1.90	2.74	38.04	1.04	51.04						1653.92
66-68	1.91	2.72	36.51	0.99	49.87						1653.92
68-70	1.91	2.73	34.65	0.95	48.63						1655.54
70-72	1.91	2.73	37.06	1.01	50.31	13.61	43.25	26.84	16.29	3.87	1653.72
72-74	1.91	2.73	35.98	0.98	49.55						1660.24
74-76	1.90	2.73	38.04	1.04	50.98						1656.97
76-78	1.93	2.74	36.87	1.01	50.23						1663.32
78-80	1.95	2.72	34.89	0.95	48.73						1655.15
80-82	1.95	2.74	31.65	0.87	46.40	15.93	43.15	23.80	17.12	3.48	1656.78
82-84	1.97	2.74	32.88	0.90	47.39						1659.84
84-86	1.95	2.73	30.10	0.82	45.07						1651.71
86-88	1.99	2.73	28.73	0.78	43.95						1656.38
88-90	1.95	2.74	32.47	0.89	47.08						1662.72
90-92	1.94	2.74	31.21	0.86	46.12	13.68	43.22	24.12	18.98	3.81	1667.46
92-94	1.94	2.74	31.90	0.87	46.66						1650.92
94-96	1.96	2.73	35.86	0.98	49.46						1774.22
96-98	1.96	2.74	33.67	0.92	47.94						1665.22
98-100	1.95	2.74	33.03	0.90	47.49						1661.93
100-102	2.02	2.76	30.59	0.84	45.79	38.01	27.89	17.47	16.63	1.96	1676.83
102-104	1.98	2.74	31.89	0.87	46.64						1671.83
104-106	2.02	2.75	29.01	0.80	44.36						1665.22
106-110	2.06	2.74	24.96	0.68	40.65						1666.87
MEAN	1.89	2.73	38.82	1.06	51.02	9.83	41.62	31.38	17.18	4.20	1658.71

KW-PE-GC-178

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Gravel	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
0-2	1.74	2.71	44.30	1.17	53.93	2.23	39.71	44.72	13.34	4.37	90.6	
2-4	1.78	2.76	42.47	1.14	53.36							
4-6	1.72	2.71	47.27	1.25	55.56							
6-8	1.73	2.72	45.43	1.21	54.66							
8-10	1.73	2.75	46.86	1.26	55.68							
10-12	1.75	2.74	45.04	1.21	54.66	0.67	29.2	50.68	19.46	5.56	91.3	
12-14	1.73	2.74	46.60	1.25	55.48							
14-16	1.75	2.71	43.72	1.16	53.66							
16-18	1.77	2.74	42.99	1.15	53.52							
18-20	1.73	2.74	46.75	1.25	55.56							
20-22	1.80	2.73	38.88	1.04	50.87	0.68	31.61	47.75	19.96	5.62	91.6	
22-24	1.80	2.73	39.38	1.05	51.25							
24-26	1.77	2.72	41.50	1.10	52.40							
26-28	1.75	2.73	44.76	1.19	54.43							
28-30	1.81	2.73	38.26	1.02	50.52							
30-32	1.82	2.71	36.69	0.97	49.24	1.51	39.68	41.83	16.98	5.2.8	91.1	
32-34	1.84	2.73	35.91	0.96	48.94							
34-36	1.85	2.72	34.67	0.92	47.97							
36-38	1.82	2.73	37.34	1.00	49.91							
38-40	1.81	2.73	38.20	1.02	50.48							
40-42	1.84	2.76	36.85	0.99	49.86	1.31	45.17	36.76	16.76	4.95	92.2	
42-44	1.84	2.75	36.79	0.99	49.71							
44-46	1.83	2.73	36.92	0.98	49.61							
46-48	1.82	2.74	37.39	1.00	49.97							
48-50	1.82	2.73	37.81	1.01	50.19							
50-52	1.82	2.73	37.46	1.00	49.97	3.06	45.43	33.39	18.12	5.12	93.1	1665.85
52-54	1.84	2.74	36.40	0.97	49.35							
54-56	1.78	2.73	40.84	1.09	52.11							1657.35

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Gravel	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
56-58	1.81	2.73	38.30	1.02	50.53							1657.54
58-60	1.81	2.73	38.34	1.02	50.55							1664.19
60-62	1.82	2.73	37.31	0.99	49.85	1.96	43.94	36.19	17.91	5.17	91.2	1659.2
62-64	1.79	2.74	40.52	1.09	52.04							1654.24
64-66	1.85	2.74	35.30	0.94	48.57							1663.79
66-68	1.80	2.75	40.19	1.08	51.89							1651.61
68-70	1.83	2.72	36.72	0.98	49.41							1654.3
70-72	1.81	2.75	38.78	1.04	51.04	2.38	44.29	35.24	18.08	5.04	91.4	1652.06
72-74	1.82	2.74	37.72	1.01	50.22							1652.91
74-76	1.83	2.73	36.44	0.97	49.30							1652.31
76-78	1.84	2.74	35.73	0.95	48.84							1650.27
78-80	1.85	2.74	35.01	0.94	48.36							1656.07
80-82	1.85	2.73	34.45	0.92	47.84	0	46.09	37.5	16.41	5.20	90.4	1656.73
82-84	1.84	2.73	35.83	0.95	48.83							
84-86	1.88	2.71	32.40	0.86	46.20							
86-88	1.82	2.74	37.93	1.02	50.39							1624.01
88-90	1.83	2.74	36.69	0.98	49.51							
90-92	1.85	2.73	34.71	0.92	48.05	4.04	47.3	30.44	18.23	4.76	90.7	1665.59
92-94	1.88	2.73	32.46	0.86	46.36							1668.95
94-96	1.87	2.73	33.49	0.89	47.13							1655.61
96-98	1.87	2.73	32.96	0.88	46.75							1662.25
98-100	1.87	2.73	33.82	0.90	47.46							1659.13
100-102	1.85	2.74	34.92	0.93	48.29	8.08	41.8	29.88	20.23	4.85	86.5	1665.99
102-104	1.91	2.75	30.71	0.83	45.22							1675.21
104-106	1.87	2.74	33.36	0.89	47.17							1660.72
106-108	1.89	2.80	33.54	0.92	47.84							
108-110	1.88	2.80	34.82	0.95	48.75							1671.56
110-112	1.88	2.74	32.94	0.88	46.81	10.1	40.95	29.62	19.33	4.55	83.8	1684.43
112-114	1.88	2.78	33.98	0.92	48.01							1675.25
114-116	1.89	2.77	32.72	0.89	46.97							1673.77

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Gravel	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
116-118	1.92	2.77	30.99	0.84	45.62							1670.4
118-120	1.93	2.78	30.34	0.82	45.18							
120-122	1.92	2.76	30.63	0.83	45.21	19.57	38.38	23.13	18.92	3.11	88.5	1680.53
122-124	1.89	2.80	33.63	0.92	47.94							1680.53
124-126	1.91	2.78	32.13	0.87	46.59							1667.25
126-128	1.91	2.77	31.62	0.85	46.07							1679.04
128-130	1.97	2.76	27.55	0.74	42.65							1692.71
130-132	1.85	2.75	35.46	0.95	48.76	5.16	42.39	26.25	26.2	6.23	86.1	
MEAN	1.83	2.74	37.15	0.99	49.68	4.34	41.14	35.96	18.57	4.96	89.89	1663.57

KW-PE-GC-203

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
0-2	1.75	2.66	42.33	1.10	52.37	4.39	18.2	57.27	20.15	5.74	81.0	1625.55
2-4	1.78	2.72	40.39	1.07	51.75						88.1	1622.37
4-6	1.79	2.70	39.12	1.03	50.74						84.5	1631.94
6-8	1.82	2.71	36.73	0.97	49.27						86.4	1630.54
8-10	1.80	2.68	37.36	0.98	49.42						86.2	1645.08
10-12	1.86	2.75	34.74	0.93	48.26	25.3	12.3	46.36	16.04	3.39	84.4	1637.36
12-14	1.89	2.74	31.93	0.85	46.05						87.2	1637.13
14-16	1.96	2.72	27.02	0.72	41.83						85.3	1621.95
16-18	1.89	2.71	31.33	0.83	45.34						85.8	1622.53
18-20	1.85	2.71	34.44	0.91	47.67						88.3	1623.12
20-22	1.83	2.71	35.73	0.95	48.59	13.78	15.71	50.71	19.79	4.59	83.1	1635.89
22-24	1.92	2.70	28.60	0.75	42.99						86.5	1626.10
24-26	1.89	2.77	33.11	0.90	47.23						82.7	1649.69
26-28	1.88	2.70	31.60	0.83	45.41						88.8	1644.01
28-30	1.84	2.70	34.59	0.91	47.66						87.0	1628.52
30-32	1.82	2.71	37.10	0.98	49.56	9.99	20.66	53.47	15.88	4.85	87.6	1615.46
32-34	1.85	2.72	34.91	0.93	48.09						87.8	1622.57
34-36	1.84	2.71	35.09	0.93	48.12						86.5	1631.35
36-38	1.89	2.70	31.01	0.82	44.95						74.2	1626.36
38-40	1.87	2.70	32.72	0.86	46.34						86.2	1613.71
40-42	1.85	2.72	34.20	0.91	47.58	8.36	18.29	57.55	15.8	5.16	83.8	1604.15
42-44	1.80	2.75	39.38	1.06	51.35						82.9	1607.06
44-46	1.82	2.75	38.04	1.02	50.52						85.8	1613.32
46-48	1.81	2.75	38.61	1.04	50.87						87.1	1608.62
48-50	1.80	2.70	38.71	1.02	50.48						87.9	1611.55
50-52	1.84	2.72	35.11	0.93	48.24	5.13	17.35	48.68	28.83		87.6	1619.42
52-54	1.82	2.70	36.77	0.97	49.18						88.1	1616.46
54-56	1.82	2.70	37.12	0.98	49.50						84.8	1621.79

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
56-58	1.80	2.76	40.29	1.08	52.01						87.2	1611.74
58-60	1.77	2.69	41.24	1.08	51.98						87.3	1612.91
60-62	1.76	2.69	42.36	1.11	52.66	0.82	11.34	57.53	30.3	6.78	87.4	1611.73
62-64	1.77	2.69	40.74	1.07	51.73						83.4	1613.88
64-66	1.77	2.70	40.95	1.08	51.91						84.8	1604.73
66-68	1.76	2.69	41.36	1.09	52.04						87.0	1611.92
68-70	1.78	2.72	40.75	1.08	51.95						85.0	1611.33
70-72	1.76	2.70	42.10	1.11	52.62	0.88	10.75	55.37	33	7.06	84.9	1611.91
72-74	1.78	2.71	40.66	1.07	51.79						86.1	1615.62
74-76	1.81	2.72	38.05	1.01	50.25						87.8	1621.70
76-78	1.76	2.80	44.93	1.23	55.10						87.4	1617.56
78-80	1.78	2.71	41.16	1.09	52.18						87.5	1611.51
80-82	1.79	2.70	39.49	1.04	50.99	1.82	10.95	57.16	30.07	6.62	87.1	1609.95
82-84	1.85	2.73	35.13	0.94	48.37						87.5	1535.58
84-86	1.85	2.71	34.02	0.90	47.34						86.7	1618.04
86-88	1.89	2.74	32.09	0.86	46.17						85.5	1571.44
88-90	1.87	2.69	32.49	0.85	46.08						86.7	1659.17
90-92	1.77	2.70	40.97	1.08	51.92	5.7	17.99	50.83	25.48	5.99	84.1	1555.98
92-94	1.78	2.69	39.86	1.05	51.18						86.6	1496.28
94-96	1.82	2.70	36.73	0.97	49.24						83.4	1588.93
96-98	1.81	2.70	37.71	0.99	49.82						84.1	1589.12
98-100	1.79	2.72	40.15	1.06	51.57						83.3	1579.91
100-102	1.78	2.69	40.04	1.05	51.31	1.64	13.57	49.17	35.62	7.36	84.2	1564.98
102-104	1.76	2.73	42.74	1.14	53.26							1569.68
104-106	1.77	2.73	42.13	1.12	52.92							1569.68
106-108	1.78	2.73	41.08	1.10	52.27							1569.68
108-110	1.79	2.74	40.90	1.09	52.24							1572.89
110-112	1.79	2.71	40.05	1.06	51.47	2.77	14.84	43.67	38.72	7.52	86.0	1578.97
112-114	1.80	2.73	39.68	1.06	51.41							1571.38
114-116	1.75	2.74	44.19	1.18	54.19							1560.89

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
116-118	1.80	2.74	39.26	1.05	51.23							1589.90
118-120	1.85	2.74	35.53	0.95	48.74							1587.01
120-122	1.83	2.73	36.60	0.98	49.43	2.16	15.28	43.81	38.74	7.69	80.2	1590.10
122-124	1.85	2.75	35.62	0.96	48.86							1581.07
124-126	1.79	2.75	40.83	1.09	52.27							1583.38
126-128	1.83	2.75	37.09	0.99	49.87							1591.66
128-130	1.87	2.75	33.69	0.91	47.51							1602.76
130-132	1.87	2.74	33.53	0.90	47.25	1.9	22.98	38.06	37.06	7.35	85.2	1591.85
132-133	1.87	2.75	34.16	0.92	47.82							1605.90
133-136	1.86	2.76	35.21	0.95	48.71							1588.96
136-138	1.82	2.76	38.60	1.04	50.95							1582.82
138-140	1.83	2.76	37.43	1.01	50.20							1579.38
140-142	1.82	2.76	38.46	1.04	50.92	3	19.93	39.73	37.3	6.87	86.0	1586.45
142-144	1.83	2.76	37.35	1.01	50.19							1586.06
144-146	1.87	2.75	34.04	0.91	47.76							1592.04
146-148	1.88	2.77	33.46	0.91	47.54							1593.59
148-150	1.85	2.76	35.99	0.97	49.27							1598.26
150-152	1.83	2.74	36.63	0.98	49.53	7.9	23.83	34.62	33.6	6.15	85.2	1586.06
152-154	1.91	2.76	31.25	0.84	45.71							1596.89
154-156	1.89	2.76	32.84	0.89	46.97							1635.19
156-158	1.87	2.76	34.35	0.93	48.07							1612.83
158-160	1.86	2.76	34.92	0.94	48.48							1594.17
160-162	1.88	2.74	32.90	0.88	46.86	6.8	32.27	31.54	29.4	5.55	82.1	1616.21
162-164	1.87	2.76	34.22	0.92	47.99							1611.44
164-166	1.88	2.77	33.94	0.92	47.84							1608.66
166-168	1.87	2.78	35.16	0.96	48.87							1522.21
168-170	1.97	2.78	27.80	0.75	42.98							1523.12
MEAN	1.83	2.73	36.86	0.98	49.40	6.02	17.43	47.97	28.58	6.17	85.53	1601.77

KW-PE-GC-208

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
0-2	1.79	2.73	40.81	1.09	52.15	0.39	10.88	69.97	18.74	6.35	87.8	1622.63
2-4	1.79	2.73	40.76	1.09	52.12							1619.46
4-6	1.77	2.73	42.25	1.13	53.01							1621.05
6-8	1.78	2.73	41.76	1.11	52.71							1619.46
8-10	1.78	2.74	41.06	1.10	52.33							1616.31
10-12	1.79	2.74	40.62	1.09	52.09	0.53	11.26	63.19	25.03	6.83	88.3	1616.11
12-14	1.75	2.73	43.72	1.17	53.82							1608.08
14-16	1.77	2.73	41.78	1.11	52.69							1610.62
16-18	1.78	2.73	41.51	1.11	52.56							1610.04
18-20	1.78	2.73	41.20	1.10	52.33							1612.59
20-22	1.76	2.74	43.85	1.17	53.96	0.30	16.18	59.15	24.37	6.39	88.4	1610.44
22-24	1.79	2.74	40.30	1.08	51.86							1613.38
24-26	1.79	2.74	41.05	1.10	52.36							1614.76
26-28	1.81	2.72	38.57	1.03	50.64							1617.91
28-30	1.82	2.73	37.97	1.01	50.34							1619.49
30-32	1.81	2.74	39.02	1.05	51.13	0.40	17.73	58.40	23.48	6.37	89.1	1616.33
32-34	1.81	2.74	38.65	1.03	50.85							1619.49
34-36	1.82	2.74	38.08	1.02	50.50							1621.28
36-38	1.85	2.73	35.21	0.94	48.40							1622.87
38-40	1.81	2.75	38.63	1.04	50.93							1619.69
40-42	1.82	2.75	38.44	1.03	50.77	0.82	18.10	57.08	24.00	6.51	88.8	1621.28
42-44	1.84	2.75	36.16	0.97	49.29							1622.87
44-46	1.83	2.75	37.41	1.00	50.12							1626.25
46-48	1.82	2.75	38.16	1.02	50.58							1624.65
48-50	1.82	2.75	38.09	1.02	50.59							1623.85
50-52	1.84	2.74	36.57	0.98	49.50	0.25	18.90	56.87	23.97	6.59	89.3	1629.03
52-54	1.84	2.75	36.67	0.98	49.62							1631.23
54-56	1.84	2.75	36.43	0.98	49.45							1630.21

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
56-58	1.83	2.75	37.35	1.00	50.07							1627.21
58-60	1.83	2.75	37.68	1.01	50.33							1629.01
60-62	1.84	2.76	36.54	0.98	49.59	1.70	14.68	59.04	24.58	6.64	90.5	1624.42
62-64	1.84	2.76	36.50	0.98	49.57							1628.59
64-66	1.83	2.76	37.65	1.01	50.33							1624.59
66-68	1.80	2.76	39.97	1.08	51.83							1624.59
68-70	1.82	2.76	38.08	1.02	50.62							1621.62
70-72	1.83	2.76	37.17	1.00	50.01	0.81	17.93	55.26	26.00	6.66	89.5	1624.79
72-74	1.82	2.75	38.01	1.02	50.54							1621.81
74-76	1.82	2.76	38.56	1.04	50.93							1621.62
76-78	1.83	2.75	37.10	1.00	49.92							1621.03
78-80	1.85	2.76	36.17	0.97	49.35							1620.64
80-82	1.83	2.76	37.22	1.00	50.04						91.5	1623.81
82-84	1.83	2.76	37.42	1.01	50.19							1625.20
84-86	1.82	2.76	38.42	1.04	50.88							1528.02
86-88	1.84	2.76	36.90	0.99	49.82							1536.84
88-90	1.94	2.77	29.63	0.80	44.48							1560.72
90-92	1.50	2.77	83.08		69.20	0.46	20.65	44.42	34.47	7.68	86.3	1540.78
92-94	1.58	2.76	67.96	1.83	64.72							1542.23
94-96	1.68	2.77	53.10	1.43	58.93							1526.23
96-98	1.73	2.77	47.20	1.28	56.08							1657.17
98-100	1.70	2.77	51.69	1.40	58.32							1647.34
100-102	1.86	2.78	35.42	0.96	49.03	1.18	18.24	40.81	39.77	8.01	88.3	1644.08
102-104	1.83	2.77	37.94	1.03	50.64							1632.60
104-106	1.82	2.76	38.16	1.03	50.74							1630.42
106-108	1.85	2.76	35.49	0.96	48.86							1642.30
108-110	1.86	2.75	34.92	0.94	48.43							1646.58
110-112	1.85	2.77	36.11	0.98	49.41	0.85	28.53	39.46	31.17	7.48	88.3	1631.06
112-114	1.82	2.76	38.83	1.05	51.16							1625.29
114-116	1.82	2.76	38.74	1.04	51.10							1629.29

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
116-118	1.83	2.76	37.48	1.01	50.25							1622.53
118-120	1.83	2.77	37.76	1.02	50.56							1626.91
120-122	1.89	2.78	33.47	0.91	47.61	0.15	21.13	41.16	37.55	8.16	87.8	1659.04
122-124	1.91	2.78	31.61	0.86	46.15							1659.04
124-126	1.95	2.76	28.23	0.76	43.25							1660.50
126-128	1.90	2.78	32.30	0.88	46.72							1655.13
128-130	1.93	2.77	30.09	0.81	44.87							1658.24
130-132	1.94	2.75	28.82	0.77	43.63	1.88	27.66	36.71	33.75	7.77	87.7	1671.21
132-134	1.94	2.76	29.13	0.79	44.00							1683.98
134-136	1.91	2.78	31.52	0.85	46.07							1675.06
136-138	1.95	2.76	28.25	0.76	43.25							1671.68
138-140	1.89	2.78	33.19	0.90	47.41							1654.78
140-142	1.91	2.78	31.62	0.86	46.19	2.33	32.12	37.40	28.15	6.43	91.1	1649.24
142-144	1.89	2.76	32.75	0.88	46.93							1659.15
144-146	1.91											1657.09
146-148	1.88	2.77	33.55	0.91	47.55							1655.23
148-150	1.90	2.75	31.73	0.85	46.04							1652.13
150-152	1.91	2.78	31.80	0.86	46.33	14.86	28.89	32.96	23.29	4.77	88.0	1650.48
152-154	1.89	2.77	32.82	0.89	47.06							1657.09
154-156	1.89	2.78	32.99	0.89	47.22							1677.04
156-158	1.91	2.81	33.02	0.91	47.56							1670.27
158-160	1.93	2.81	30.91	0.85	45.85							1682.15
160-162	1.91	2.75	30.91	0.83	45.36	16.36	35.93	26.73	20.99	4.19	91.7	1680.44
162-164	1.92	2.80	31.68	0.87	46.46							1471.36
164-166	1.89	2.78	33.15	0.90	47.38							1661.88
166-168	1.92	2.78	30.95	0.84	45.67							1665.23
168-170	1.91	2.77	31.49	0.85	45.97							1675.34
170-172	1.92	2.77	30.64	0.83	45.32	4.59	33.18	39.27	22.96	6.00	90.9	1680.65
172-174	1.93	2.77	29.81	0.81	44.66							1679.14
174-176	1.92	2.77	30.46	0.82	45.15							1671.48

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
176-178	1.90	2.75	32.03	0.86	46.25							1660.56
178-180	1.91	2.75	31.26	0.84	45.67							1658.44
180-182	1.91	2.77	31.27	0.85	45.82	5.23	25.72	43.85	25.19	6.34	92.7	1671.75
182-184	1.92	2.76	30.96	0.84	45.53							1666.45
184-186	1.87	2.75	34.22	0.92	47.86							1543.08
186-188	1.94	2.76	29.02	0.78	43.88							1544.95
188-190	1.86	2.78	35.36	0.96	48.99							1545.86
190-192	1.91	2.76	31.49	0.85	45.91	3.65	29.25	42.49	24.60	6.17	90.6	1634.03
192-194	1.88	2.75	32.88	0.88	46.89							1626.21
194-196	1.80	2.76	40.08	1.08	51.90							1539.19
196-198	1.86	2.75	34.45	0.93	48.09							1646.52
198-200	1.91	2.76	31.17	0.84	45.64							1646.72
200-202	1.84	2.76	37.02	1.00	49.94	4.23	25.76	45.67	24.33	6.20	90.9	1643.75
202-204	1.85	2.81	37.29	1.02	50.53							1648.63
204-206	1.85	2.78	36.39	0.99	49.66							1645.18
206-208	1.88	2.76	33.52	0.90	47.43							1653.14
208-210	1.83	2.75	36.92	0.99	49.82							1633.88
210-212	1.82	2.76	38.61	1.04	50.99	0.94	22.29	52.34	24.43	6.50	92.5	1630.68
212-214	1.84	2.77	36.70	0.99	49.84							1638.70
214-216	1.85	2.80	37.37	1.02	50.58							1641.93
216-218	1.88	2.77	33.70	0.91	47.67							1648.43
218-220	1.87	2.75	34.02	0.91	47.76							1645.18
220-222	1.87	2.75	34.07	0.92	47.78						91.4	1651.70
222-224	1.89	2.77	32.96	0.89	47.10							1650.26
224-226	1.90	2.77	32.34	0.87	46.61							1647.00
226-228	1.85	2.74	35.75	0.96	48.93							1642.13
228-230	1.86	2.79	36.11	0.98	49.55							1642.13
230-232	1.84	2.75	36.42	0.98	49.44						91.0	1639.29
232-234	1.83	2.77	37.76	1.02	50.53							1638.27
234-236	1.85	2.77	36.22	0.98	49.46							1638.67

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
236-238	1.83	2.74	37.08	0.99	49.80							1639.66
MEAN	1.85	2.76	36.70	0.98	49.39	2.95	22.62	47.73	26.71	6.57	89.68	1630.23

KW-PE-GC-210

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
0-2	1.69	2.71	50.24	1.33	57.08	0.59	22.67	51.48	25.26	5.97	84.8	
2-4	1.68	2.73	52.76	1.41	58.48							
4-6	1.71	2.73	49.27	1.32	56.81							
6-8	1.74	2.72	44.95	1.20	54.46							
8-10	1.72	2.76	47.98	1.29	56.37							
10-12	1.75	2.73	44.76	1.19	54.43	1.79	21	56.24	20.98	5.5	87.1	
12-14	1.74	2.74	45.86	1.23	55.10							
14-16	1.67	2.73	53.27	1.42	58.70							1632.98
16-18	1.67	2.74	53.64	1.44	58.94							1611.34
18-20	1.70	2.74	50.62	1.36	57.55							1572.03
20-22	1.70	2.75	50.61	1.36	57.61	1.55	25.5	52.45	20.5	4.93	86.9	1586.73
22-24	1.68	2.75	52.59	1.41	58.53							1632.53
24-26	1.75	2.74	44.95	1.20	54.64							1647.38
26-28	1.78	2.75	41.73	1.12	52.83							1640.10
28-30	1.78	2.75	42.13	1.13	53.08							1640.89
30-32	1.80	2.74	39.67	1.06	51.53	1.25	26.02	50.23	22.49	5.36	89.1	1638.63
32-34	1.79	2.75	40.89	1.10	52.33							1645.83
34-36	1.77	2.74	42.17	1.13	53.05							1650.68
36-38	1.78	2.74	41.72	1.12	52.76							1659.03
38-40	1.79	2.75	41.01	1.10	52.41							1652.70
40-42	1.79	2.76	40.94	1.10	52.44	6.47	33.47	40.55	19.51	4.7	90.1	1651.43
42-44	1.80	2.76	40.57	1.09	52.22							1656.50
44-46	1.82	2.76	38.56	1.04	50.99							1658.33
46-48	1.79	2.75	40.96	1.10	52.42							1658.53
48-50	1.81	2.75	39.09	1.05	51.25							1661.80
50-52	1.81	2.75	39.36	1.06	51.41	3.19	32.44	44.17	20.2	5.26	91.1	1660.16
52-54	1.84	2.76	36.17	0.97	49.33							1663.64
54-56	1.82	2.77	38.97	1.05	51.29							1660.56

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
56-58	1.80	2.77	40.46	1.09	52.26							1657.29
58-60	1.80	2.76	40.77	1.10	52.39							1652.61
60-62	1.79	2.79	41.72	1.14	53.19	4.37	32.8	41.96	20.87	4.9	91.0	1652.61
62-64	1.77	2.80	44.17	1.21	54.71							1638.14
64-66	1.79	2.80	42.26	1.16	53.61							1647.76
66-68	1.79	2.77	41.40	1.12	52.84							1653.84
68-70	1.80	2.77	40.16	1.09	52.08							1655.27
70-72	1.83	2.77	37.44	1.01	50.31	4.73	33.09	41.04	21.14	4.97	91.6	1653.44
72-74	1.83	2.76	37.08	1.00	49.94							1656.11
74-76	1.83	2.76	37.66	1.01	50.35							1658.58
76-78	1.85	2.75	35.73	0.96	48.98							1654.72
78-80	1.83	2.77	37.72	1.02	50.48							1655.56
80-82	1.86	2.77	35.41	0.96	48.88	3.46	36.75	38.52	21.26	5.38	90.5	1656.21
82-84	1.83	2.76	37.86	1.02	50.54							
84-86	1.95	2.77	28.79	0.78	43.76							
86-88	1.99	2.77	25.76	0.70	41.05							
88-90	1.96	2.74	27.42	0.73	42.29							
90-92	1.91	2.82	32.44	0.89	47.15	7.1	34.74	35.98	22.17	5.36	92.1	
92-94	1.92	2.77	30.80	0.83	45.41							
94-96	1.91	2.76	31.11	0.84	45.62							
96-98	1.91	2.76	31.28	0.84	45.78							
98-100	1.92	2.77	30.76	0.83	45.39							1622.30
100-102	1.90	2.77	31.92	0.86	46.36	5.3	36.78	36.52	21.41	5.19	92.0	1622.50
102-104	1.93	2.74	29.16	0.78	43.85							1617.69
104-106	1.90	2.78	32.32	0.88	46.70							1616.09
106-108	1.92	2.79	31.36	0.85	46.05							1620.89
108-110	1.91	2.79	31.70	0.86	46.31							1617.89
110-112	1.92	2.77	30.78	0.83	45.46	15.17	38.21	27.92	18.7	3.98	89.6	1613.11
112-114	1.93	2.75	29.89	0.80	44.56							1616.49
114-116	1.91	2.76	30.95	0.83	45.49							1618.29

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
116-118	1.89	2.80	34.07	0.93	48.22							1608.75
118-120	1.94	2.80	30.31	0.83	45.28							1621.49
120-122	1.93	2.78	30.32	0.82	45.19	12.5	34.26	29.43	23.81	4.95	90.5	1619.89
122-124	1.92	2.79	31.32	0.85	46.03							1620.08
124-126	1.94	2.76	28.95	0.78	43.80							1622.90
126-128	1.93	2.78	30.55	0.83	45.33							1621.09
128-130	1.94	2.78	29.58	0.80	44.52							1612.91
130-132	1.94	2.79	29.99	0.82	44.97	10.2	40.03	30.64	19.13	4.56	90.3	1616.50
132-134	1.92	2.77	30.76	0.83	45.39							1608.55
134-136	1.94	2.80	30.41	0.83	45.42							1611.92
136-138	1.94	2.78	29.37	0.80	44.33							1616.30
138-140	1.91	2.83	33.24	0.92	47.89							1602.06
140-142	1.89	2.77	32.98	0.89	47.15	13.77	42.92	25.1	18.12	4.03	91.6	1602.25
142-144	1.95	2.77	29.03	0.79	44.01							1603.82
144-146	1.92	2.79	31.13	0.85	45.92							1608.55
146-148	1.84	2.73	35.87	0.96	48.89							1583.84
148-150	1.90	2.76	31.74	0.85	46.07							1579.25
150-152	1.91	2.78	31.40	0.85	46.01	10.18	41.81	25.24	22.76	4.68	89.3	1613.51
152-154	1.95	2.76	28.08	0.76	43.05							1620.51
154-156	1.95	2.78	28.78	0.78	43.82							1626.58
156-158	1.96	2.77	28.10	0.76	43.21							1630.03
158-160	2.00	2.80	26.29	0.72	41.78							1636.56
160-162	1.97	2.77	27.40	0.74	42.57	7.77	43.13	26.71	22.38	5.29	91.0	1653.13
162-164	1.96	2.80	28.54	0.78	43.84							
164-166	1.97	2.77	27.48	0.74	42.60							1659.85
166-168	1.97	2.79	28.10	0.76	43.32							1642.30
168-170	1.97	2.76	27.28	0.74	42.37							1638.57
170-172	2.00	2.77	25.71	0.70	41.02	12.82	42.92	23.91	20.36	4.28	89.8	1645.97
172-174	1.97	2.80	28.29	0.77	43.62							1639.78
174-176	1.98	2.76	26.70	0.72	41.84							1643.88

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
176-178	1.95	2.76	28.37	0.77	43.35							1642.19
178-180	1.87	2.77	34.58	0.94	48.32							
180-182	1.86	2.77	34.95	0.95	48.60	7.14	44.61	24.77	23.48	5.23	89.9	1638.08
182-184	1.87	2.76	34.60	0.93	48.29							
184-186	1.91	2.77	31.66	0.86	46.12							1683.78
186-188		2.77										1677.01
188-190												
190-192	1.94	2.77	29.37	0.79	44.28	1.41	41.22	22.62	34.75	5.88	90.1	1678.78
MEAN	1.86	2.77	35.82	0.97	48.68	6.54	35.22	36.27	21.96	5.02	89.92	1634.67

KW-PE-GC-213

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
0-2	1.68	2.74	52.74	1.41	58.49	0.03	13.25	65.86	20.85	6.45	88.4	
2-4	1.65	2.74	56.16	1.50	60.04							
4-6	1.66	2.74	55.64	1.49	59.85							
6-8	1.68	2.74	53.19	1.42	58.75							
8-10	1.73	2.74	46.65	1.25	55.51							
10-12	1.78	2.74	41.25	1.10	52.45	0.1	14.09	62.97	22.83	6.59	88.7	
12-14	1.80	2.74	39.22	1.05	51.21							
14-16	1.80	2.74	39.39	1.05	51.27							
16-18	1.78	2.74	41.21	1.10	52.42							
18-20	1.80	2.73	38.99	1.04	51.00							
20-22	1.79	2.74	40.59	1.08	52.03	0.32	15.31	60.34	24.03	6.7	89.1	
22-24	1.80	2.74	39.69	1.06	51.53							1610.82
24-26	1.80	2.74	39.62	1.06	51.51							1619.07
26-28	1.80	2.74	39.88	1.07	51.58							1611.40
28-30	1.81	2.74	39.05	1.04	51.08							1614.54
30-32	1.82	2.74	37.79	1.01	50.24	0.09	20.7	56.87	22.34	6.53	89.1	1613.17
32-34	1.79	2.74	40.25	1.08	51.83							1614.74
34-36	1.83	2.74	37.23	1.00	49.90							1622.83
36-38	1.83	2.74	37.23	1.00	49.93							1626.21
38-40	1.81	2.74	39.09	1.05	51.15							1617.09
40-42	1.84	2.74	36.16	0.97	49.20	0.71	31.02	49.77	18.5	5.58	90.1	1623.42
42-44	1.84	2.74	36.51	0.98	49.44							1615.91
44-46	1.82	2.74	37.81	1.01	50.30							1624.01
46-48	1.83	2.74	36.80	0.99	49.65							1624.20
48-50	1.84	2.75	36.78	0.99	49.69							1624.40
50-52	1.83	2.75	37.30	1.00	50.05	0.32	25.32	50.86	23.5	6.52	89.5	1621.42
52-54	1.82	2.75	38.40	1.03	50.76							1619.84
54-56	1.84	2.75	36.73	0.99	49.64							1624.79

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
56-58	1.84	2.75	36.39	0.98	49.39							1628.37
58-60	1.81	2.75	38.72	1.04	50.94							1625.18
60-62	1.83	2.75	36.98	0.99	49.83	0.72	31.28	45.71	22.29	6.2	85.4	1623.99
62-64	1.83	2.74	37.27	1.00	49.97							1620.82
64-66	1.84	2.74	35.88	0.96	48.99							1627.17
66-68	1.83	2.75	37.16	1.00	49.90							1621.01
68-70	1.82	2.75	38.47	1.03	50.81							1617.86
70-72	1.82	2.75	37.70	1.01	50.31	0.56	28.03	46.7	24.71	5.96	89.3	1622.79
72-74	1.84	2.76	36.92	0.99	49.85							1624.77
74-76	1.85	2.76	35.74	0.96	49.05							1631.15
76-78	1.86	2.76	35.25	0.95	48.70							1632.94
78-80	1.86	2.75	34.81	0.94	48.34							
80-82	1.91	2.75	30.74	0.83	45.26	1.99	29.81	43.92	24.27	6.45	89.0	
82-84	1.93	2.75	29.79	0.80	44.45							
84-86	1.86	2.75	35.04	0.94	48.49							
86-88	1.82	2.75	38.03	1.02	50.57							
88-90	1.88	2.75	33.11	0.89	47.10							
90-92	1.90	2.75	32.07	0.86	46.30	0.76	27.3	47.62	24.32	6.58	89.8	
92-94	1.89	2.76	32.90	0.89	46.97							
94-96	1.90	2.76	31.58	0.85	45.95							
96-98	1.86	2.76	34.84	0.94	48.42							
98-100	1.91	2.76	31.13	0.84	45.61							
100-102	1.92	2.75	30.56	0.82	45.12	0.71	35.43	40.81	23.04	6.01	89.9	
102-104	1.90	2.78	32.85	0.89	47.18							
104-106	1.87	2.76	34.00	0.92	47.85							
106-108	1.89	2.78	32.89	0.89	47.14							
108-110	1.87	2.76	34.06	0.92	47.83							
110-112	1.90	2.77	32.44	0.88	46.74	1.27	33.62	40.49	24.62	6.09	90.0	1623.90
112-114	1.93	2.75	29.64	0.80	44.30							1640.32
114-116	1.90	2.77	32.10	0.87	46.45							1626.72

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
116-118	1.89	2.75	32.11	0.86	46.31							1625.11
118-120	1.89	2.78	33.53	0.91	47.65							1620.49
120-122	1.88	2.74	33.13	0.89	46.99	2.26	35.8	39.27	22.68	5.98	89.6	1615.71
122-124	1.89	2.74	31.92	0.85	46.09							1617.10
124-126	1.88	2.80	34.43	0.94	48.53							1615.51
126-128	1.89	2.77	33.20	0.90	47.34							1623.50
128-130	1.91	2.75	31.11	0.83	45.50							1617.10
130-132	1.81	2.76	39.60	1.07	51.63	2.64	27.42	46.65	23.29	6.27	90.4	1596.46
132-134	1.78	2.76	42.24	1.14	53.23							1596.65
134-136	1.88	2.76	33.19	0.89	47.19							1613.92
136-138	1.88	2.79	34.59	0.94	48.55							1613.92
138-140	1.90	2.79	32.57	0.89	47.01							1622.10
140-142	1.89	2.76	32.38	0.87	46.61	5.55	37.58	34	22.88	5.81	90.1	1626.92
142-144	1.91											1618.90
144-146	1.90	2.76	31.90	0.86	46.23							1629.95
146-148	1.90	2.74	31.75	0.85	45.96							1623.50
148-150	1.91	2.76	31.38	0.85	45.86							1613.92
150-152	1.92	2.76	30.69	0.83	45.27	2.5	35.49	37.64	24.36	6.4		1623.50
152-154	1.91	2.78	31.62	0.86	46.16							
154-156	1.93	2.78	30.73	0.84	45.52							1626.92
156-158	1.89	2.75	32.44	0.87	46.52							1617.30
158-160	1.89	2.78	33.15	0.90	47.32							1620.49
160-162	1.91	2.79	32.35	0.88	46.85	6.64	38.57	32	22.79	5.75		1628.73
162-164	1.92	2.76	30.66	0.83	45.22							1625.51
164-166	1.96	2.76	27.80	0.75	42.82							1619.90
166-168	1.97	2.76	27.09	0.73	42.19							1637.89
168-170	1.94	2.77	29.29	0.79	44.19							1636.65
170-172	1.94	2.78	29.37	0.80	44.36	5.26	43.88	30.32	20.53	5.28		1638.69
172-174	1.96	2.75	27.74	0.74	42.68							1645.46
174-176	1.95	2.76	28.45	0.77	43.43							

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
176-178	2.04	2.77	23.08	0.62	38.42							
178-180	1.93	2.76	29.51	0.80	44.31							
180-182	1.96	2.78	28.61	0.78	43.72	9.62	47.4	24.7	18.28	4.41		1650.35
182-184	1.91	2.77	31.36	0.85	45.94							
184-186	1.93	2.79	30.73	0.84	45.61							1642.49
186-188	1.93	2.78	30.10	0.82	45.01							1634.35
188-190	1.95	2.78	28.82	0.78	43.93							1640.86
190-192	1.94	2.77	29.32	0.79	44.24	6.31	46.14	25.92	21.63	5.18		1637.79
192-194	1.91	2.76	31.47	0.85	45.90							1626.49
194-196	1.93	2.77	30.27	0.82	45.03							1629.70
196-198	1.94	2.77	29.42	0.80	44.29							1626.68
198-200	1.94	2.77	29.18	0.79	44.13							1647.81
200-202	1.90	2.79	32.76	0.89	47.17	3.37	42	28.02	26.61	6.16		1628.69
202-204	1.88	2.77	33.32	0.90	47.37							1628.27
204-206	1.93	2.76	29.59	0.80	44.38							1646.33
206-208	1.92	2.79	31.40	0.86	46.12							1636.73
208-210	1.93	2.77	29.73	0.80	44.57							1633.50
210-212	1.92	2.77	30.57	0.83	45.26	2.09	43.92	27.8	26.2	6.32		1631.88
212-214	1.88	2.77	33.22	0.90	47.29							1627.26
214-216	1.94	2.77	29.14	0.79	44.11							1638.76
216-218	1.94	2.77	29.48	0.80	44.36							1647.13
218-220	1.94	2.78	29.46	0.80	44.41							1639.16
220-222	1.92	2.77	30.45	0.82	45.17	2.48	35.19	30.64	31.69	6.96		1631.06
222-224	1.92	2.77	30.87	0.84	45.52							1639.35
224-226	1.96	2.76	27.99	0.75	43.02							1631.26
226-228	1.92	2.76	30.82	0.83	45.39							1637.93
228-230	1.95	2.77	28.55	0.77	43.58							1646.09
230-232	1.95	2.78	28.69	0.78	43.78	1.69	29.78	35.4	33.13	7.51		1644.45
232-234	1.93	2.75	29.32	0.79	44.08							1639.75
234-236	1.94	2.76	28.75	0.77	43.65							1635.08

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
236-238	1.96	2.76	27.82	0.75	42.81							1635.08
MEAN	1.88	2.76	34.19	0.92	47.66	2.42	32.01	41.85	23.72	6.15	89.23	1626.91

KW-PE-GC-218

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Gravel	% Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)
0-2	1.54	2.74	75.20		66.76	0.05	23.6	55.14	21.21	7.07	
2-4	1.74	2.75	45.56	1.22	55.00						
4-6	1.78	2.74	41.49	1.11	52.62						
6-8	1.78	2.74	41.27	1.11	52.51						
8-10	1.75	2.75	44.48	1.19	54.40						
10-12	1.86	2.75	35.04	0.94	48.45	0.53	31	47.47	21	6.25	
12-14	1.82	2.74	37.53	1.00	50.12						
14-16	1.84	2.74	36.54	0.98	49.45						1586.9
16-18	1.85	2.74	35.30	0.94	48.57						1600.9
18-20	1.85	2.73	34.81	0.93	48.16						1605.7
20-22	1.84	2.74	36.15	0.97	49.17	1.35	37.05	41.07	20.54	5.51	1604.1
22-24	1.87	2.75	33.54	0.90	47.35						1605.7
24-26	1.86	2.75	34.37	0.92	47.97						1604.1
26-28	1.88	2.74	32.94	0.88	46.88						1608.4
28-30	1.87	2.75	33.90	0.91	47.63						1606.6
30-32	1.89	2.75	32.23	0.87	46.41	1.68	41.82	37.92	18.57	5.17	1613.2
32-34	1.88	2.75	33.61	0.90	47.49						1606.8
34-36	1.89	2.75	32.56	0.87	46.61						1611.8
36-38	1.89	2.74	31.96	0.86	46.13						1624.7
38-40	1.92	2.75	30.18	0.81	44.78						1628.5
40-42	1.91	2.75	30.63	0.82	45.14	3.34	46.2	34.29	16.17	4.77	1629.3
42-44	1.91	2.76	31.02	0.84	45.51						1628.3
44-46	1.86	2.76	34.79	0.94	48.36						1615.8
46-48	1.89	2.76	32.52	0.88	46.67						1619.4
48-50	1.89	2.76	32.49	0.88	46.70						1621.4
50-52	1.90	2.76	32.15	0.87	46.42	2.62	40.91	34.71	21.76		1621.6
52-54	1.89	2.76	32.98	0.89	47.07						1621.6
54-56	1.89	2.76	32.81	0.88	46.95						1617.2

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Gravel	% Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)
56-58	1.88	2.77	33.29	0.90	47.34						1606.0
58-60	1.89	2.76	32.99	0.89	47.06						1620.4
60-62	1.89	2.76	32.43	0.87	46.66	1.62	41.73	36.6	20.05	5.22	1623.6
62-64	1.88	2.76	33.82	0.91	47.73						1621.8
64-66	1.87	2.77	34.62	0.93	48.32						1604.5
66-68	1.91	2.76	31.02	0.84	45.57						1617.2
68-70	1.90	2.77	31.84	0.86	46.25						1620.2
70-72	1.88	2.77	33.28	0.90	47.35	0.82	38.46	39.09	21.63	5.65	1618.2
72-74	1.92	2.77	31.06	0.84	45.66						1622.8
74-76	1.91	2.79	32.04	0.87	46.58						1625.6
76-78	1.90	2.77	32.12	0.87	46.52						1620.6
78-80	1.92	2.76	30.62	0.83	45.25						1626.5
80-82	2.00	2.76	25.59	0.69	40.84	3.04	49.33	29.44	18.19	4.74	1645.4
82-84	1.95	2.77	28.70	0.78	43.73						1632.2
84-86	1.94	2.77	29.77	0.81	44.64						1627.3
86-88	1.95	2.77	28.59	0.77	43.61						1626.1
88-90	1.94	2.80	30.45	0.83	45.42						1630.3
90-92	1.97	2.78	28.02	0.76	43.22	9.63	46.01	25.31	19.05	4.51	1640.7
92-94	1.90	2.75	31.97	0.86	46.20						
94-96	1.92	2.75	30.16	0.81	44.79						
96-98	1.92	2.75	30.07	0.81	44.71						
98-100	1.88	2.77	33.77	0.91	47.71						
100-102	1.94	2.77	29.43	0.80	44.31	9.47	49.01	21.43	20.09	4.56	1643.2
102-104	1.92	2.78	30.77	0.84	45.53						
104-106	1.95	2.81	29.96	0.82	45.11						1639.5
106-108	1.96	2.77	27.87	0.75	42.99						1643.0
108-110	1.92	2.78	30.57	0.83	45.32						1629.4
110-112	1.91	2.77	31.28	0.85	45.84	6.26	47.57	25.79	20.36	4.78	1626.1
112-114	1.90	2.77	32.07	0.87	46.42						1631.5
114-116	1.90	2.76	32.24	0.87	46.50						1628.7

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Gravel	% Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)
116-118	1.91	2.80	32.63	0.89	47.17						1637.2
118-120	1.89	2.78	33.60	0.91	47.74						1627.5
120-122	1.94	2.77	29.27	0.79	44.19	9.43	45.31	25.24	20.02	4.61	1637.4
122-124	1.94	2.79	29.73	0.81	44.74						1642.1
124-126	1.95	2.79	29.66	0.81	44.73						1633.0
126-128	1.95	2.80	29.53	0.81	44.70						1641.3
128-130	1.94	2.79	30.18	0.82	45.13						1622.3
130-132	1.95	2.77	28.49	0.77	43.53	3.54	42.84	29.33	24.3	5.45	1647.5
132-134	1.96	2.78	28.32	0.77	43.42						1657.1
134-136	1.98	2.78	27.01	0.73	42.30						1660.0
136-138	1.96	2.79	28.59	0.78	43.79						1648.2
138-140	1.98	2.78	26.90	0.73	42.22						1653.2
140-142	1.94	2.78	29.42	0.80	44.40	1.11	35.96	33.01	29.92	6.77	1646.5
142-144	1.97	2.78	27.45	0.75	42.73						1648.2
144-146	1.98	2.81	27.40	0.75	42.88						1661.5
146-148	1.99	2.79	26.52	0.72	41.93						1653.2
148-150	1.99	2.77	26.21	0.71	41.51						1654.8
150-152	1.95	2.78	29.26	0.79	44.27	3.02	44.48	25.94	26.56	5.9	1665.3
MEAN	1.90	2.77	32.48	0.86	46.42	3.59	41.33	33.86	21.21	5.40	1627.95

KW-PE-GC-220

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)
0-2	1.55	2.66	70.03	1.82	64.48	0.14	16.10	62.69	21.07	6.02	1610.27
2-4	1.58	2.68	65.00	1.70	63.00						1619.61
4-6	1.61	2.70	60.34	1.59	61.37						1618.05
6-8	1.69	2.69	49.61	1.30	56.56						1624.52
8-10	1.73	2.70	45.31	1.19	54.42						1635.62
10-12	1.73	2.69	44.89	1.18	54.14	0.33	15.67	63.18	20.82	5.89	1640.23
12-14	1.76	2.71	42.26	1.12	52.78						1638.43
14-16	1.77	2.68	41.01	1.08	51.81						1640.04
16-18	1.77	2.70	40.97	1.08	51.95						1635.23
18-20	1.78	2.72	40.95	1.09	52.10						1633.83
20-22	1.75	2.72	43.88	1.16	53.80	0.37	22.54	56.49	20.59	5.74	1635.43
22-24	1.74	2.72	45.23	1.20	54.58						1627.29
24-26	1.79	2.73	40.52	1.08	51.89						1623.55
26-28	1.76	2.72	42.96	1.14	53.31						1626.51
28-30	1.79	2.72	39.95	1.06	51.48						1627.31
30-32	1.80	2.72	39.19	1.04	50.98	0.95	29.17	51.69	18.19	5.42	1628.70
32-34	1.80	2.71	38.97	1.03	50.78						1627.92
34-36	1.83	2.72	36.88	0.98	49.53						1631.90
36-38	1.80	2.72	38.62	1.03	50.66						1627.75
38-40	1.86	2.73	34.39	0.92	47.79						1636.73
40-42	1.87	2.73	33.15	0.88	46.92	2.02	33.31	47.90	16.76	5.09	1641.36
42-44	1.84	2.73	35.84	0.95	48.84						1639.36
44-46	1.81	2.73	38.63	1.03	50.71						1634.15
46-48	1.82	2.72	36.67	0.97	49.31						1632.74
48-50	1.84	2.72	35.85	0.95	48.80						1629.55
50-52	1.89	2.73	31.47	0.84	45.60	3.96	29.88	47.20	18.96	5.31	1642.38
52-54	1.87	2.73	32.91	0.88	46.72						1637.55
54-56	1.84	2.72	35.52	0.95	48.59						

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)
56-58	1.83	2.73	36.27	0.97	49.15						1647.05
58-60	1.84	2.73	35.63	0.95	48.70						1643.81
60-62	1.85	2.72	35.15	0.93	48.32	2.94	32.88	44.82	19.36	5.28	1645.62
62-64	1.82	2.71	36.98	0.98	49.50						1644.00
64-66	1.80	2.73	39.60	1.06	51.36						1634.34
66-68	1.82	2.73	37.84	1.01	50.23						1635.94
68-70	1.86	2.72	34.22	0.91	47.61						1638.96
70-72	1.84	2.73	35.91	0.96	48.89	4.52	41.20	38.94	15.35	4.56	1642.19
72-74	1.88	2.73	32.38	0.86	46.36						1645.62
74-76	1.85	2.73	34.69	0.92	48.05						1648.04
76-78	1.87	2.73	33.25	0.89	46.96						1647.01
78-80	1.85	2.74	35.28	0.94	48.53						1650.66
80-82	1.87	2.74	33.75	0.90	47.43	4.52	33.64	41.96	19.85	5.41	1651.05
82-84	1.92	2.73	29.79	0.79	44.23						1656.16
84-86	1.84	2.74	36.23	0.97	49.23						1663.95
86-88	1.97	2.76	26.97	0.73	42.07						
88-90	1.96	2.73	31.34	0.84	45.53						
90-92	1.90	2.73	26.83	0.72	41.73	3.39	39.39	39.22	18.01	4.95	
92-94	1.96	2.73	28.18	0.75	42.92						
94-96	1.94	2.73	29.89	0.80	44.37						
96-98	1.92	2.74	28.49	0.76	43.28						1596.59
98-100	1.94	2.73	27.82	0.74	42.59						1586.79
100-102	1.95	2.73	29.54	0.79	44.07	5.83	39.07	37.15	17.95	4.76	1587.75
102-104	1.92	2.75	26.79	0.72	41.86						1585.80
104-106	1.97	2.74	30.12	0.81	44.66						1585.80
106-108	1.92	2.78	28.71	0.78	43.82						1593.23
108-110	1.95	2.77	28.78	0.78	43.79						1585.78
110-112	1.95	2.74	28.23	0.76	43.03						1597.56
112-114	1.94	2.76	26.88	0.72	41.96						1597.36
114-116	1.97	2.79	27.88	0.76	43.18						1600.14

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)
116-118	1.97	2.76	29.12	0.79	43.98						1598.35
118-120	1.94	2.81	27.99	0.77	43.43						1604.92
120-122	1.98	2.74	28.17	0.75	42.98	4.66	43.98	36.63	14.74	4.19	1590.66
122-124	1.95	2.77	24.96	0.68	40.33						1592.23
124-126	2.01	2.82	28.30	0.78	43.79						1592.43
126-128	1.98	2.77	27.05	0.73	42.27						1597.16
128-130	1.98	2.78	24.70	0.67	40.14						1597.16
130-132	2.02	2.76	25.76	0.69	40.98	13.51	54.44	19.38	12.66	3.05	1596.76
132-134	1.99	2.79	26.46	0.72	41.92						1604.72
134-136	1.99	2.78	25.19	0.68	40.61						1595.17
136-138	2.01	2.81	26.58	0.73	42.14						1595.17
138-140	2.00	2.78	26.25	0.71	41.63						1631.97
140-142	1.99	2.75	24.46	0.66	39.64	8.14	49.91	23.96	17.99	4.20	1609.13
142-144	2.01	2.81	26.90	0.74	42.43						1613.97
144-146	1.99	2.77	26.88	0.73	42.10						1609.33
146-148	1.98	2.79	25.02	0.68	40.50						1615.79
148-150	2.02	2.77	27.72	0.75	42.88						1601.53
150-152	1.97	2.74	26.47	0.71	41.46	16.96	42.85	24.46	15.73	2.98	1609.53
152-154	1.97	2.76	26.92	0.72	42.01						1608.53
154-156	1.97	2.76	27.53	0.74	42.60						
156-158	1.96	2.77	28.06	0.76	43.14						1595.39
158-160	1.96	2.77	26.88	0.73	42.11						1597.17
160-162	1.98	2.75	27.33	0.73	42.33	11.37	42.90	25.98	19.75	4.46	1597.17
162-164	1.96	2.75	25.77	0.69	40.94						1599.94
164-166	1.99	2.77	26.70	0.72	41.95						1599.94
166-168	1.98	2.75	27.30	0.73	42.33						1603.32
168-170	1.96	2.80	26.34	0.72	41.88						1603.32
170-172	2.00	2.75	26.72	0.72	41.78	3.99	43.13	27.98	24.89	5.72	1608.32
172-174	1.97	2.76	26.53	0.71	41.66						1611.74
174-176	1.98	2.79	25.60	0.70	41.12						1596.98

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)
176-178	2.01	2.77	24.86	0.67	40.19						1601.54
178-180	2.01	2.82	28.17	0.78	43.72						1621.03
180-182	1.98	2.76	28.54	0.77	43.48	3.64	39.16	30.29	26.92	6.67	1620.01
182-184	1.95	2.77	30.47	0.82	45.16						1625.30
184-186	2.05	2.77	33.71	0.91	47.68						
186-188	2.09	2.77	35.04	0.95	48.67						1628.48
188-190	1.92	2.76	33.42	0.90	47.40						1492.68
190-192	1.88	2.76	30.26	0.82	44.92	2.71	32.19	28.03	37.07	6.74	1622.08
192-194	1.86	2.79	30.08	0.82	45.08						1621.10
194-196	1.88	2.77	29.29	0.79	44.21						
196-198	1.92	2.81	31.93	0.87	46.65						1636.17
198-200	1.94	2.77	31.91	0.86	46.34						
200-202	1.94	2.77	30.28	0.82	45.03	2.67	30.68	36.68	29.97	6.43	1665.15
202-204	1.92	2.77	31.76	0.86	46.21						1659.98
204-206	1.90	2.79	34.46	0.94	48.44						1658.33
206-208	1.93	2.74	32.78	0.88	46.69						1661.64
208-210	1.91	2.77	33.41	0.90	47.49						1658.33
210-212	1.88	2.75	37.45	1.01	50.14	6.88	26.32	31.15	35.65	7.41	1658.33
212-214	1.88	2.75	35.15	0.95	48.59						1643.63
214-216	1.88	2.80	35.90	0.98	49.51						1638.79
216-218	1.83	2.76	33.79	0.91	47.64						1638.99
218-220	1.86	2.72	38.46	1.02	50.56						1621.47
220-222	1.86	2.74	44.09	1.18	54.13	1.70	18.27	38.64	41.39	9.20	1621.86
222-224	1.87	2.74	43.86	1.17	54.02						1629.98
224-226	1.81	2.80	43.30	1.18	54.18						1638.36
226-228	1.75	2.75	42.60	1.14	53.33						1610.33
228-230	1.76	2.75	42.41	1.14	53.26						1589.84
230-232	1.78	2.75	74.32	2.00	66.62	2.04	23.08	34.20	4.68	7.00	1593.06
232-234	1.77	2.76	44.52	1.20	54.54						1594.39
234-236	1.77										1602.03

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)
MEAN	1.89	2.75	34.02	0.91	47.07	4.66	33.90	38.64	21.23	5.50	1620.26

KW-PE-GC-222

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
0-2	1.71	2.70	47.16	1.24	55.39	0	12.31	66.48	21.21	6.34	90.6	
2-4	1.71	2.70	48.09	1.27	55.88							
4-6	1.76	2.73	42.95	1.15	53.42							
6-8	1.74	2.69	44.37	1.17	53.83							
8-10	1.75	2.73	44.33	1.18	54.19							
10-12	1.77	2.73	42.10	1.12	52.90	0.17	14.69	63.23	21.92	6.29	91.8	
12-14	1.76	2.71	42.98	1.14	53.23							
14-16	1.78	2.71	40.70	1.08	51.82							
16-18	1.82	2.70	36.21	0.96	48.86							
18-20	1.81	2.69	36.92	0.97	49.28							1608.80
20-22	1.83	2.72	35.97	0.96	48.86	0.69	16.02	60.17	23.12	6.43	93.1	
22-24	1.81	2.71	37.39	0.99	49.70							
24-26	1.77	2.76	43.37	1.17	53.89							1609.41
26-28	1.76	2.74	43.31	1.16	53.67							
28-30	1.79	2.75	40.82	1.10	52.31							
30-32	1.83	2.72	36.57	0.97	49.23	1.86	20.68	56.62	20.84	5.99	92.2	
32-34	1.86	2.79	36.11	0.98	49.57							1576.73
34-36	1.91	2.70	29.53	0.78	43.80							1576.73
36-38	1.87	2.69	32.10	0.84	45.77							1566.55
38-40	1.89	2.75	32.18	0.86	46.33							1570.16
40-42	1.91	2.77	31.33	0.85	45.87	0.85	23.68	54.04	21.44	6.05	92.1	1571.30
42-44	1.87	2.80	35.12	0.96	49.01							1566.12
44-46	1.9	2.75	32.00	0.86	46.22							1562.49
46-48	1.89	2.74	32.00	0.86	46.13							1565.73
48-50	1.89	2.77	32.73	0.88	46.94							1568.78
50-52	1.9	2.70	30.39	0.80	44.45	1.09	18.43	55.69	24.79	6.62	92.7	1562.88
52-54	1.91	2.73	30.46	0.81	44.85							1567.26
54-56	1.9	2.70	30.12	0.79	44.26							1568.98

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
56-58	1.9	2.81	33.12	0.91	47.57							1562.88
58-60	1.89	2.73	31.72	0.85	45.85							1562.88
60-62	1.89	2.79	33.20	0.90	47.48	1.07	21.7	39.43	37.8	5.92	92.5	1566.12
62-64	1.89	2.77	32.48	0.88	46.74							1564.05
64-66	1.9	2.71	30.57	0.81	44.76							1563.51
66-68	1.9	2.71	30.70	0.81	44.84							1561.26
68-70	1.88	2.71	32.35	0.86	46.16							1562.04
70-72	1.9	2.74	31.03	0.83	45.33	1	22.63	52.81	23.56	6.54	93.5	1564.13
72-74	1.89	2.71	31.17	0.82	45.18							1562.27
74-76	1.92	2.71	28.99	0.77	43.39							1571.04
76-78	1.9	2.73	30.81	0.82	45.09							1574.53
78-80	1.9	2.72	31.15	0.83	45.29							1573.42
80-82	1.9	2.73	31.53	0.84	45.70	1.17	22.16	51.82	24.85	6.96	93.5	1574.98
82-84	1.91	2.72	29.66	0.79	44.02							1576.90
84-86	1.92	2.78	30.98	0.84	45.65							1579.03
86-88	1.89	2.70	30.84	0.81	44.89							1586.24
88-90	1.91	2.75	30.64	0.82	45.16							1556.63
90-92	2	2.73	24.71	0.66	39.73	5.13	28.16	45.08	21.63	5.9	91.1	1577.12
92-94	1.89	2.76	32.90	0.89	47.03							1515.57
94-96	1.86	2.72	34.07	0.90	47.46							
96-98	1.89	2.75	32.78	0.88	46.83							
98-100	1.87	2.72	32.97	0.88	46.73							
100-102	1.89	2.73	31.85	0.85	45.89	1.34	28.37	46.81	23.48	6.07	92.7	
102-104	1.89	2.74	31.80	0.85	45.99							
104-106	1.89	2.77	32.76	0.89	47.00							
106-108	1.89	2.74	32.02	0.86	46.09							
108-110	1.88	2.76	33.55	0.90	47.49							
110-112	1.9	2.73	31.25	0.83	45.42	2.03	24.14	47.48	26.35	6.71	92.2	
112-114	1.87	2.79	35.08	0.95	48.82							
114-116	1.86	2.77	35.24	0.95	48.80							

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
116-118	1.9	2.75	31.69	0.85	46.00							
118-120	1.89	2.79	33.03	0.90	47.32							
120-122	1.88	2.73	32.82	0.87	46.63	5.59	31.55	40.82	22.04	5.92	96.3	
122-124	1.88	2.74	32.67	0.87	46.61							1611.00
124-126	1.89	2.79	33.12	0.90	47.41							1614.17
126-128	1.91	2.75	31.27	0.84	45.67							1628.80
128-130	1.89	2.75	32.50	0.87	46.63							1623.56
130-132	1.94	2.73	28.46	0.76	43.14	3.49	31.06	33.9	31.56	5.9	93.4	1631.24
132-134	1.92	2.76	30.56	0.82	45.12							1624.78
134-136	1.93	2.78	30.28	0.82	45.11							1615.17
136-138	1.9	2.78	32.82	0.89	47.11							1618.36
138-140	1.92	2.79	31.44	0.86	46.16							1623.37
140-142	1.91	2.79	31.82	0.87	46.46	7.02	33.36	38.16	21.46	5.62	89.8	1621.36
142-144	1.91	2.77	31.32	0.85	45.85							1622.97
144-146	1.91	2.77	31.30	0.85	45.86							1629.22
146-148	1.9	2.79	32.58	0.89	47.06							1620.17
148-150	1.91	2.79	32.05	0.87	46.65							1616.38
150-152	1.87	2.79	34.82	0.95	48.67	8.78	36.68	35.13	19.41	4.81	93.2	1611.21
152-154	1.89	2.77	32.71	0.88	46.91							1609.63
154-156	1.91	2.79	32.12	0.87	46.66							1635.36
156-158	1.95	2.76	28.56	0.77	43.50							1633.53
158-160	1.96	2.78	28.53	0.77	43.65							1644.21
160-162	1.95	2.78	29.17	0.79	44.17	12.96	30.95	32.73	23.37	5.6	93.3	1640.91
162-164	1.93	2.80	30.91	0.84	45.77							1631.10
164-166	1.92	2.78	30.87	0.84	45.60							1480.57
166-168	1.92	2.80	31.60	0.86	46.33							1647.52
168-170	1.93	2.81	30.93	0.85	45.87							1631.10
170-172	1.91	2.74	30.92	0.83	45.30	10.36	28.58	38.11	22.96	5.64	95.1	1634.76
172-174	1.96	2.78	28.40	0.77	43.57							1640.27
174-176	1.9											1620.57

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
176-178	1.93	2.75	29.74	0.80	44.44							1635.93
178-180	1.94	2.78	29.95	0.81	44.84							1643.09
180-182	1.97	2.74	26.62	0.71	41.60	2.59	35.56	34.17	27.69	6.31	90.1	1649.45
182-184	1.97	2.80	28.23	0.77	43.52							1651.06
184-186	1.91	2.80	32.25	0.88	46.82							
186-188	2.01											1614.87
188-190	2.04	2.80	24.03	0.66	39.63							
190-192	1.91	2.79	32.03	0.87	46.58	1.85	38.19	31.93	28.02	6.27	90.5	
192-194	1.85											
194-196	1.92	2.76	30.72	0.83	45.28							1661.92
196-198	1.88	2.81	34.80	0.96	48.86							1651.68
198-200	1.84	2.76	36.17	0.97	49.33							1654.95
200-202	1.87	2.78	34.98	0.95	48.69	1.93	27.69	37.21	33.17	7.52	90.9	1654.95
202-204	1.88	2.81	35.06	0.96	49.07							1638.53
204-206	1.89	2.82	34.27	0.94	48.54							1637.94
206-208	1.86	2.82	36.91	1.02	50.41							1630.96
208-210	1.86	2.79	36.16	0.99	49.65							1630.37
210-212	1.87	2.77	34.49	0.93	48.26	0.8	22.37	39.77	37.07	7.83	88.7	1635.16
212-214	1.88	2.78	33.51	0.91	47.59							1643.00
214-216	1.92	2.83	32.46	0.90	47.29							1648.90
216-218	1.92	2.75	30.05	0.81	44.66							1655.44
218-220	1.87	2.76	33.99	0.92	47.83							1627.80
220-222	1.85	2.77	36.08	0.97	49.35	2.2	24.86	36.6	36.34	7.61	86.6	1622.86
222-224	1.84	2.77	36.73	0.99	49.85							1622.47
224-226	1.81	2.83	41.65	1.15	53.47							1612.47
226-228	1.84	2.75	36.21	0.97	49.32							1608.97
228-230	1.83	2.75	36.87	0.99	49.77							1613.26
230-232	1.86	2.73	33.92	0.90	47.45	0.44	19.69	40.74	39.13	7.89	88.7	1619.33
232-234	1.81	2.77	39.43	1.07	51.65							1605.30
234-236	1.79	2.79	42.41	1.16	53.63							1597.60

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
236-238	1.82	2.76	38.79	1.05	51.13							1608.39
238-240	1.81	2.74	38.43	1.03	50.66							1600.67
240-242	1.6	2.74	63.30	1.69	62.88	0.12	16.53	42.74	40.61	8.13	85.9	1604.33
MEAN	1.88	2.75	33.89	0.91	47.45	2.98	25.20	44.87	26.95	6.43	91.62	1604.94

KW-PE-GC-224

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
0-2	1.71	2.73	48.29	1.29	56.32	0.18	27.37	52.8	19.65	5.73	92.8	
2-4	1.75	2.76	45.52	1.23	55.10							
4-6	1.71	2.80	50.19	1.37	57.81							
6-8	1.71	2.75	48.88	1.31	56.80							
8-10	1.74	2.75	45.83	1.23	55.20							
10-12	1.73	2.73	46.23	1.23	55.23	0.5	21.1	54.84	23.55	6.29	94.0	
12-14	1.75	2.76	45.46	1.22	55.05							
14-16	1.74	2.72	45.28	1.20	54.62							
16-18	1.75	2.75	44.44	1.19	54.39							
18-20	1.78	2.75	42.19	1.13	53.09							
20-22	1.78	2.74	41.74	1.12	52.80	0.81	32.31	46.71	20.16	5.68	92.4	
22-24	1.78	2.76	42.15	1.14	53.17							
24-26	1.80	2.76	40.19	1.08	51.97							
26-28	1.81	2.76	39.62	1.07	51.67							1662.79
28-30	1.81	2.82	40.76	1.12	52.87							1677.82
30-32	1.83	2.78	37.66	1.02	50.54	1.59	42	38.4	18.01	5.2	92.9	1678.75
32-34	1.85	2.78	36.37	0.99	49.68							1681.52
34-36	1.82	2.75	37.82	1.01	50.37							1675.59
36-38	1.82	2.80	39.26	1.07	51.77							1679.15
38-40	1.82	2.75	38.30	1.03	50.70							1677.67
40-42	1.83	2.76	37.27	1.00	50.12	1.18	38.78	40.79	19.25	5.44	92.5	1671.37
42-44	1.79	2.74	40.08	1.07	51.73							1664.93
44-46	1.79	2.75	40.36	1.08	51.99							1659.98
46-48	1.81	2.75	39.19	1.05	51.25							1655.26
48-50	1.81	2.75	38.84	1.04	51.06							1666.98
50-52	1.81	2.76	38.82	1.05	51.11	1.39	43.59	36.02	19	5.21	93.2	1658.73
52-54	1.82	2.72	36.94	0.98	49.55							1662.02
54-56	1.82	2.75	37.83	1.01	50.37							1658.73

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
56-58	1.83	2.74	36.90	0.99	49.64							1665.13
58-60	1.81	2.74	38.76	1.04	50.88							1661.62
60-62	1.83	2.73	36.75	0.98	49.52	2.83	43.81	33.39	19.97	5.34	92.5	1663.27
62-64	1.82	2.71	36.61	0.97	49.22							1659.98
64-66	1.82	2.70	37.05	0.98	49.43							1663.47
66-68	1.80	2.73	39.45	1.05	51.28							1656.89
68-70	1.83	2.71	36.38	0.96	49.09							1658.53
70-72	1.83	2.73	37.03	0.99	49.67	3.78	41.92	35.93	18.37	5.15	91.2	1665.13
72-74	1.83	2.80	38.42	1.05	51.25							1669.91
74-76	1.83	2.75	37.31	1.00	50.03							1663.08
76-78	1.82	2.71	36.64	0.97	49.26							1661.23
78-80	1.82	2.77	38.28	1.03	50.83							1664.53
80-82	1.82	2.76	38.36	1.04	50.87	4.27	45.39	31.75	18.59	5.04	88.6	1665.99
82-84	1.85	2.75	35.98	0.97	49.17							1669.31
84-86	1.83	2.75	37.62	1.01	50.29							1662.68
86-88	1.83	2.78	38.36	1.04	50.97							1662.48
88-90	1.86	2.78	35.78	0.97	49.30							1671.84
90-92	1.84	2.77	36.77	0.99	49.83	4.86	46.73	29.62	18.78	4.79	92.4	
92-95	1.91	2.76	31.32	0.84	45.78							
95-100	2.00	2.78										
100-102	1.90	2.76				5.94	48.65	27.01	18.4	4.59	89.6	
102-104	1.88	2.76	34.67	0.96	49.11							
104-106	1.90	2.79	34.75	0.97	49.16							
106-108	1.91	2.83	36.32	1.01	50.27							1651.76
108-110	1.91	2.77	34.06	0.95	48.67							1643.53
110-112	1.90	2.77	31.46	0.85	46.01	4.95	46.29	31.89	16.87	4.74	91.5	1641.89
112-114	1.88	2.80	33.96	0.95	48.59							1645.17
114-116	1.93	2.79	34.73	0.97	49.15							1646.61
116-118	1.93	2.83	35.78	1.00	49.89							1654.87
118-120	1.92	2.77	32.54	0.91	47.52							1649.90

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	% Sand	% Silt	% Clay	MGS (phi)	% Carb	Vp (m/s)
120-122	1.91	2.81	31.20	0.86	46.15	36.68	32.58	17.19	13.55	2.22		
122-124	1.85	2.79	32.98	0.92	47.86							
124-126	1.48	2.79	33.39	0.93	48.17							
126-128	1.79	2.77	38.17	1.06	51.51							
128-130	1.85	2.76										
130-132	1.85	2.79	41.65	1.13	53.12	11.73	43.33	28.91	16.02	3.71	91.7	1630.54
132-134	1.89	2.82	37.91	1.08	51.08							
134-136	1.91	2.78	36.26	1.06	49.63							
136-138	1.92	2.77	32.86	0.98	47.04							
138-140	1.95	2.78	31.61	0.93	46.16							
140-142	1.91	2.80	31.52	0.86	46.27	5.6	33.77	33.63	26.99	7.04	91.7	1669.26
142-144	1.89	2.77	28.63	0.85	43.68							1656.63
144-146	1.91	2.82	32.50	0.93	47.23							
146-148	1.99	2.76	32.77	0.98	46.92							1649.55
148-150	1.82	2.78	31.89	0.94	46.42					5.08		1664.95
MEAN	1.83	2.76	37.87	1.03	50.46	5.75	39.17	35.93	19.14	5.08	91.93	1661.84

KW-PE-GC-225

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	%Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)
0-2	1.81	2.71	37.70	1.00	49.94	0.04	31.01	47.77	21.18	5.95	1583.15
2-4	1.78	2.72	40.55	1.08	51.84						1580.07
4-6	1.82	2.73	37.70	1.00	50.12						1580.65
6-8	1.82	2.71	37.16	0.98	49.61						1576.63
8-10	1.87	2.73	33.66	0.90	47.30						1584.91
10-12	1.85	2.71	34.62	0.92	47.79	1.79	26.62	49.28	22.31	6.16	1583.56
12-14	1.85	2.73	35.25	0.94	48.44						1583.76
14-16	1.85	2.79	36.90	1.01	50.13						1577.61
16-18	1.87	2.72	32.61	0.86	46.38						1580.68
18-20	1.84	2.71	35.49	0.94	48.42						1574.74
20-22	1.87	2.71	32.88	0.87	46.54	0.59	30.32	45.17	23.92	6.17	1580.87
22-24	1.87	2.72	33.16	0.88	46.83						1585.50
24-26	1.90	2.73	31.19	0.83	45.43						1584.15
26-28	1.90	2.72	30.60	0.81	44.83						1588.80
28-30	1.90	2.84	34.40	0.95	48.82						1591.91
30-32	1.88	2.73	32.38	0.86	46.36	2.42	40.75	36.69	20.14	5.57	1589.00
32-34	1.90	2.83	33.84	0.94	48.36						1584.35
34-36	1.90	2.74	31.16	0.83	45.48						1598.57
36-38	1.90	2.75	31.39	0.84	45.74						1603.10
38-40	1.95	2.74	27.90	0.75	42.70						1601.71
40-42	1.92	2.77	30.85	0.83	45.48	3.31	43.24	34.24	19.22	5.52	1597.57
42-44	1.89	2.79	34.01	0.93	48.14						1586.82
44-46	1.91	2.74	30.81	0.83	45.24						1590.32
46-48	1.95	2.75	28.39	0.76	43.30						1601.91
48-50	1.90	2.76	31.55	0.85	45.92						1592.67
50-52	1.91	2.76	31.43	0.85	45.89	2.40	46.07	31.19	20.34	5.45	1594.24
52-54	1.90	2.76	32.05	0.86	46.31						1592.67
54-56	1.90	2.79	32.45	0.88	46.93						1594.44

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	%Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)
56-58	1.91	2.74	30.75	0.82	45.10						1592.87
58-60	1.90	2.81	33.62	0.92	48.03						1586.64
60-62	1.89	2.75	32.37	0.87	46.52	2.27	43.73	32.35	21.64	5.48	1591.51
62-64	1.91	2.82	32.83	0.91	47.51						1596.20
64-66	1.90	2.77	32.23	0.87	46.58						1594.83
66-68	1.91	2.74	30.82	0.83	45.21						1594.83
68-70	1.95	2.75	28.03	0.75	42.98						1597.97
70-72	1.90	2.78	32.27	0.88	46.73	4.79	43.72	29.98	21.51	5.30	1596.40
72-74	1.92	2.74	29.76	0.80	44.37						1597.97
74-76	1.92	2.78	31.25	0.85	45.90						1594.24
76-78	1.94	2.77	29.73	0.81	44.60						1602.11
78-80	1.93	2.76	27.67	0.75	42.71						1598.76
80-82	1.96	2.75	27.34	0.73	42.32	2.67	44.57	33.27	19.49	5.11	1604.49
82-84	1.96	2.78	27.67	0.75	42.92						1605.88
84-86	1.97	2.74	30.29	0.81	44.74						1610.67
86-88	1.91	2.81	23.53	0.64	39.19						
88-90	2.05	2.75	22.30	0.60	37.43						
90-92	2.04	2.77	31.05	0.84	45.65	6.31	47.66	28.78	17.25	4.55	
92-95	1.96	2.76	27.85	0.75	42.87						
95-98	1.92	2.79	26.41	0.72	41.84						
98-100	1.99	2.80	28.63	0.78	43.89						
100-102	1.99	2.75	27.12	0.73	42.10	6.93	47.14	28.19	17.75	4.50	1611.00
102-104	1.96	2.77	26.42	0.71	41.65						1614.41
104-106	1.96	2.82	28.50	0.78	43.96						1609.59
106-108	1.98	2.81	27.60	0.76	43.12						1608.80
108-110	1.97	2.82	27.15	0.75	42.75						1609.40
110-112	1.98	2.80	26.38	0.72	41.87	3.21	45.27	30.24	21.28	5.42	1608.60
112-114	1.99	2.75	25.73	0.69	40.88						1617.86
114-116	2.00	2.80	27.70	0.76	43.13						1613.62
116-118	1.98	2.78	26.79	0.73	42.14						1602.60

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	%Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)
118-120	1.99	2.86	28.24	0.79	44.06						1607.40
120-122	1.99	2.77	25.86	0.70	41.12	5.03	46.09	28.55	20.33	5.08	
122-124	1.99	2.78	25.53	0.69	40.97						1607.40
124-126	2.01	2.79	25.79	0.70	41.31						1608.62
126-128	2.01	2.77	25.73	0.70	41.06						1606.20
128-130	2.00	2.79	25.20	0.69	40.74						1591.06
130-132	2.02	2.82	25.84	0.71	41.61	4.20	43.99	33.72	18.10	5.06	1596.21
132-134	2.02	2.78	23.33	0.63	38.79						1608.21
134-136	2.04	2.77	24.10	0.65	39.50						1613.46
136-138	2.03	2.76	23.56	0.64	38.87						1614.27
138-140	2.03	2.78	24.24	0.66	39.66						1614.88
140-142	2.02	2.79	24.78	0.68	40.32	4.14	34.16	30.68	31.03	6.49	1620.17
142-144	2.02	2.78	24.52	0.66	39.93						1614.47
144-146	2.02	2.82	26.72	0.73	42.35						1614.05
146-148	2.00	2.82	26.18	0.72	41.87						1602.80
148-150	2.01	2.81	27.38	0.75	42.91						1600.22
150-152	1.99	2.75	26.09	0.70	41.21	3.67	38.24	30.45	27.64	6.32	1601.02
152-154	1.98	2.77	27.59	0.75	42.73						1599.83
154-156	1.97	2.75	26.57	0.71	41.66						1597.45
156-158	1.98	2.77	27.09	0.73	42.32						1596.87
158-160	1.98	2.78	23.85	0.65	39.29						1607.40
160-162	2.03	2.76	24.51	0.66	39.77	3.76	41.42	26.29	28.53	6.48	1614.63
162-164	2.01	2.77	27.00	0.73	42.21						1623.94
164-166	1.98	2.76	27.03	0.73	42.18						1606.20
166-168	1.97	2.80	30.92	0.85	45.83						1610.79
168-170	1.93	2.76	31.40	0.85	45.87						1586.75
170-172	1.91	2.79	30.80	0.84	45.61	2.33	29.37	33.80	34.50	7.44	1586.18
172-174	1.93	2.76	29.61	0.80	44.39						1601.45
174-176	1.93	2.76	27.88	0.75	42.89						1600.66
176-178	1.96	2.80	29.60	0.81	44.71						1609.18

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	%Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)
178-180	1.95	2.78	31.71	0.86	46.28						1605.21
180-182	1.91	2.82	33.23	0.91	47.77	1.57	24.59	35.93	37.91	7.73	
182-184	1.90	2.75	28.62	0.77	43.44						1591.87
184-186	1.94	2.78	29.36	0.80	44.32						1506.30
186-188	1.94	2.74	27.09	0.73	42.03						1648.43
188-190	1.96	2.73									
190-192	1.80	2.78	39.78	1.07	51.63		19.46	41.93	37.76	7.95	1580.63
192-194	1.77	2.75	43.99	1.20	54.47						1574.80
194-196	1.80	2.79	38.81	1.03	50.80						1616.73
196-198	1.87	2.72	33.44	0.89	47.22						1650.20
198-200	1.88	2.74	32.96	0.88	46.94						1653.46
200-202	1.82	2.75	38.14	1.03	50.73	0.92	12.26	45.73	41.09	8.18	1634.09
202-204	1.79	2.76	40.95	1.10	52.39						1618.49
204-206	1.83	2.75	37.83	1.03	50.64						1633.28
206-208	1.85	2.78	35.02	0.94	48.37						1644.90
208-210	1.27	2.74									1755.44
210-212	1.07	2.74				4.83	11.33	44.97	38.87	8.01	
212-214	1.75	2.76									
214-216	1.74	2.81									
216-218											
218-220											
220-222						6.1	6.29	41.41	46.2	8.52	
MEAN	1.91	2.77	30.19	0.82	44.70	3.20	35.96	35.42	25.54	6.09	1602.12

KW-PE-GC-227

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	%Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)
0-2	1.69	2.73	51.12	1.37	57.84	0.4	28.98	52.58	18.04	5.6	
2-4	1.74	2.75	45.94	1.23	55.18						
4-6	1.73	2.74	47.03	1.26	55.78						
6-8	1.74	2.75	46.12	1.24	55.34						
8-10	1.74	2.75	45.80	1.23	55.19						
10-12	1.73	2.75	47.09	1.26	55.78	0.4	25.55	53.25	20.8	6.07	
12-14	1.74	2.74	45.55	1.22	54.99						
14-16	1.69	2.75	51.48	1.39	58.08						
16-18	1.74	2.76	45.55	1.22	55.03						
18-20	1.77	2.75	42.89	1.15	53.52						
20-22	1.80	2.75	40.24	1.08	51.97	1.29	33.49	44.16	21.06	5.81	
22-24	1.77	2.75	43.04	1.16	53.63						
24-26	1.76	2.75	44.16	1.19	54.30						
26-28	1.74	2.76	45.41	1.22	54.94						
28-30	1.78	2.75	41.77	1.12	52.84						
30-32	1.78	2.75	41.91	1.12	52.87	1.57	41.42	39.69	17.31	5.09	
32-34	1.75	2.74	44.82	1.20	54.64						
34-36	1.82	2.75	38.24	1.02	50.60						1625.66
36-38	1.80	2.74	39.59	1.06	51.50						1676.21
38-40	1.78	2.75	41.26	1.11	52.50						1678.48
40-42	1.84	2.74	36.22	0.97	49.28	1.93	40.54	38.67	18.86	5.41	1670.40
42-44	1.77	2.75	43.05	1.16	53.63						1684.18
44-46	1.80	2.75	40.09	1.08	51.84						1669.21
46-48	1.83	2.75	37.71	1.01	50.36						1657.92
48-50	1.81	2.75	39.12	1.05	51.31						1674.38
50-52	1.80	2.76	39.90	1.07	51.79	0.68	37.15	42.05	20.11	5.87	1671.06
52-54	1.81	2.76	38.87	1.05	51.11						1661.38
54-56	1.82	2.75	38.65	1.04	51.00						1669.61

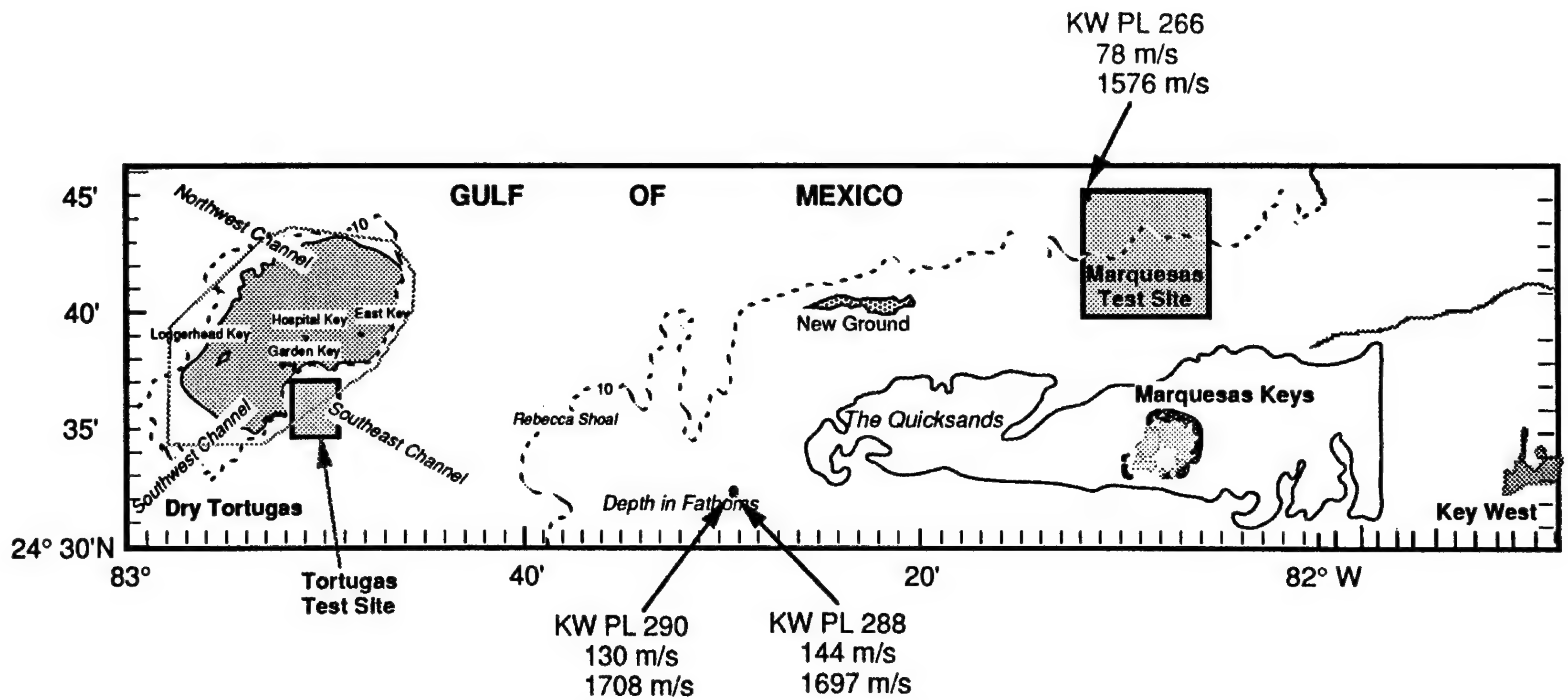
Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	%Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)
56-58	1.81	2.76	39.06	1.05	51.29						1673.12
58-60	1.78	2.76	41.73	1.13	52.94						1666.50
60-62	1.79	2.76	40.99	1.11	52.50	7.03	39.29	36.66	17.02	4.87	1664.86
62-64	1.83	2.76	37.82	1.02	50.58						1655.06
64-66	1.81	2.77	39.37	1.06	51.46						1667.95
66-68	1.83	2.76	37.51	1.01	50.26						1669.61
68-70	1.81	2.76	38.95	1.05	51.23						1664.26
70-72	1.83	2.76	38.09	1.03	50.74	3.77	45.78	33.63	16.81	4.67	1667.56
72-74	1.84	2.77	36.76	0.99	49.80						1664.46
74-76	1.82	2.76	38.38	1.04	50.94						1667.76
76-78	1.81	2.77	39.12	1.06	51.37						1671.06
78-80	1.80	2.77	40.30	1.09	52.07						1668.15
80-82	1.85	2.76	36.44	0.99	49.63	6.54	44.69	30.96	17.8	4.75	1666.70
82-84	1.84	2.77	36.95	1.00	49.97						1672.25
84-86	1.84	2.77	37.31	1.01	50.28						1673.05
86-88	1.83	2.78	37.50	1.01	50.29						1686.82
88-90	1.91	2.76									1562.54
90-92	1.99	2.77				3.82	42.57	33.43	20.18	5.25	1660.13
92-95	1.68	2.77									
95-98	1.74	2.77									
98-100	1.86	2.77	34.97	0.95	48.61						
100-102	1.88	2.77	33.97	0.92	47.89	8.63	43.69	28.85	18.82	4.24	
102-104	1.92	2.82	32.09	0.88	46.93						1649.40
104-106	1.94	2.81	30.28	0.83	45.36						1651.25
106-108	1.91	2.80	32.35	0.88	46.90						1649.60
108-110	1.95	2.79	29.40	0.80	44.44						
110-112	1.93	2.78	30.10	0.82	44.97	11.42	41.03	27.56	20	4.38	1651.45
112-114	1.95	2.81	29.81	0.82	44.98						1641.83
114-116	1.94	2.77	29.49	0.80	44.35						1656.80
116-118	1.92	2.83	32.40	0.90	47.25						1669.09

Sample Interval (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Water Content (%)	Void Ratio	Porosity (%)	% Grav.	%Sand	% Silt	% Clay	MGS (phi)	Vp (m/s)
118-120	1.96	2.86	30.35	0.85	45.87						1652.45
120-122	1.97	2.77	27.13	0.73	42.33	15.94	34.1	25.32	24.64	4.62	1660.73
122-124	2.03	2.77	23.81	0.64	39.14						1681.14
124-126	1.93	2.77	29.72	0.80	44.52						1643.02
126-128	1.95	2.80	29.71	0.81	44.82						1630.30
128-130	1.96	2.82	29.62	0.82	44.91						1635.12
130-132	1.89	2.77	33.00	0.89	47.17	11.62	29.92	30.22	28.25	5.76	1656.55
132-134	1.92	2.75	30.08	0.81	44.68						1640.17
134-136	1.94	2.84	30.85	0.85	46.07						1638.75
136-138	1.94	2.83	31.14	0.86	46.24						1655.30
138-140	1.95	2.77	28.94	0.78	43.95						1659.01
140-142	1.94	2.80	30.08	0.82	45.13	7.65	47	30.11	15.25	4.43	1648.08
142-144	1.94	2.82	30.89	0.85	45.98						1640.53
MEAN	1.84	2.77	37.60	1.02	50.07	5.51	38.35	36.48	19.66	5.12	1658.59

3.3 In-Situ Geoacoustic Measurements (Richardson)

ISSAMS was deployed at 12 sites near the Dry Tortugas, two sites at Rebecca Shoals, and one site north of the Marquesas. Station locations can be found in Figs. 3.3.1 and 3.3.2 with a summary of the mean and range of values of shear and compressional wave velocity as well as compressional wave attenuation presented in Table 3.3.1. Comparison of values of laboratory and in-situ geoacoustic properties to sediment physical properties are found in Tables 3.3.2 through 3.3.5. Gradients of shear and compressional wave velocity in the upper 2 m of sediment were all measured near the *Planet* site (see Fig. 3.3.2). Values are presented in tabular (Tables 3.3.6 and 3.3.7) and graphical (Figs. 3.3.3 and 3.3.4) form.

3.3.1 In-situ geoacoustic measurement locations (ISSAMS) including values of compressional and shear wave velocity (m/s) for two sites near Rebecca Shoals and one location in the Marquesas test site. Eleven sampling locations in the Tortugas test site are depicted in the next panel.



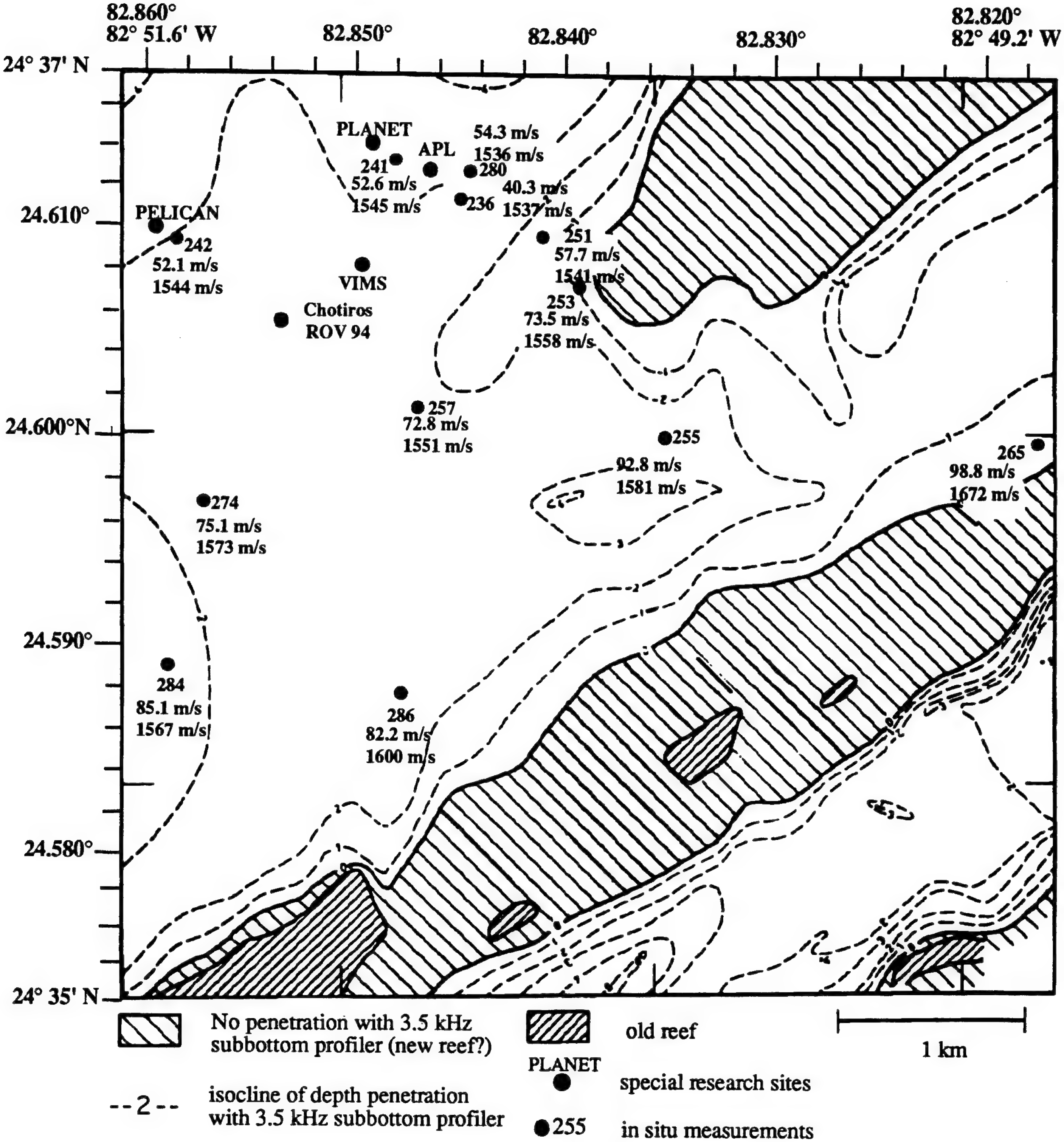


Figure 3.3.2 Shear and compressional wave velocities for sampling locations in the Dry Tortugas. The map of surface sediment thickness and locations of reef material was prepared from 100 kHz side-scan sonar and 3.5-kHz subbottom profile data by Hannelore Fiedler of FWG (Kiel, Germany).

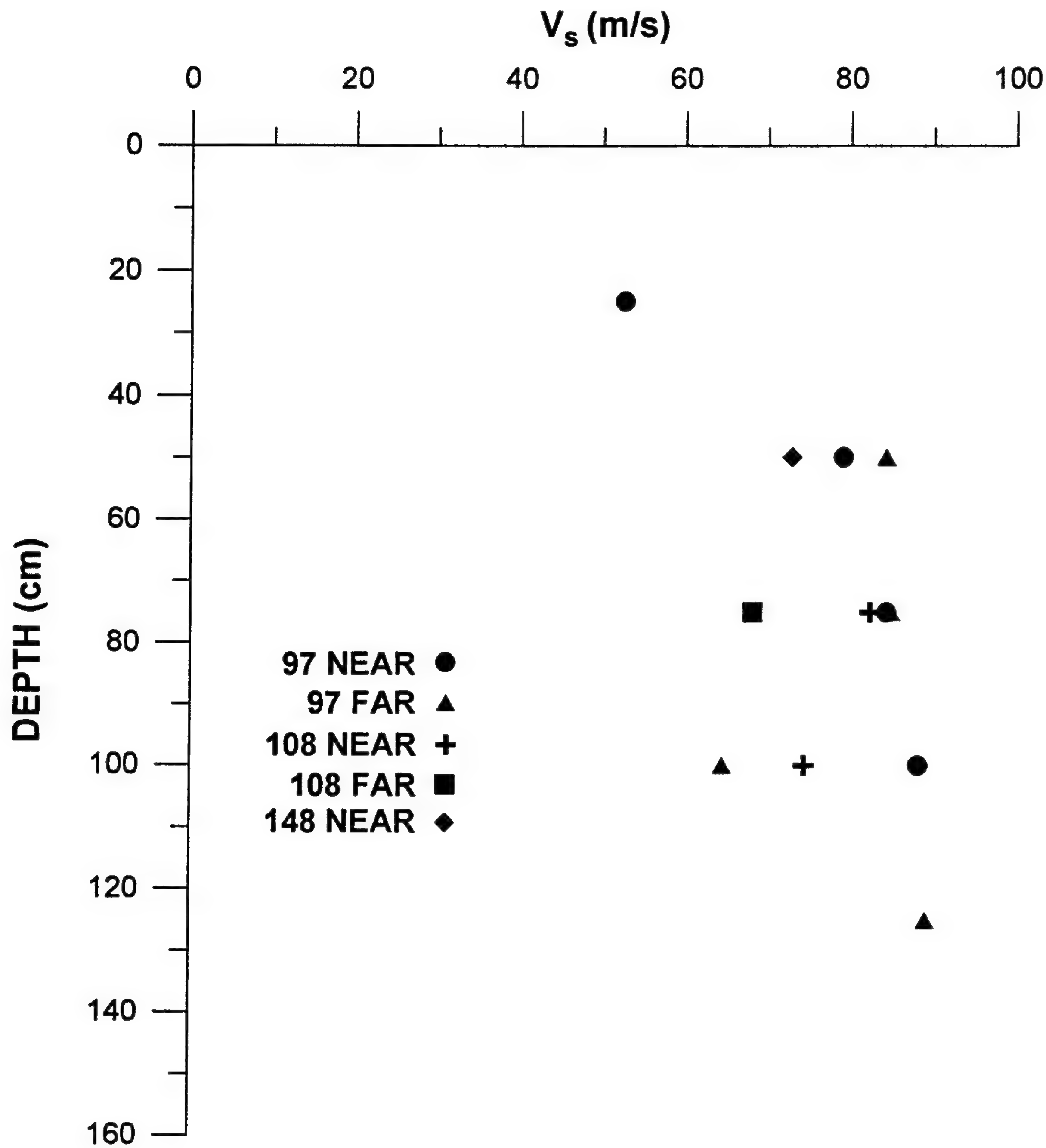


Figure 3.3.3 Gradient of shear wave velocity (m/s) from carbonate sediments at the Planet site, Dry Tortugas, Florida Keys.

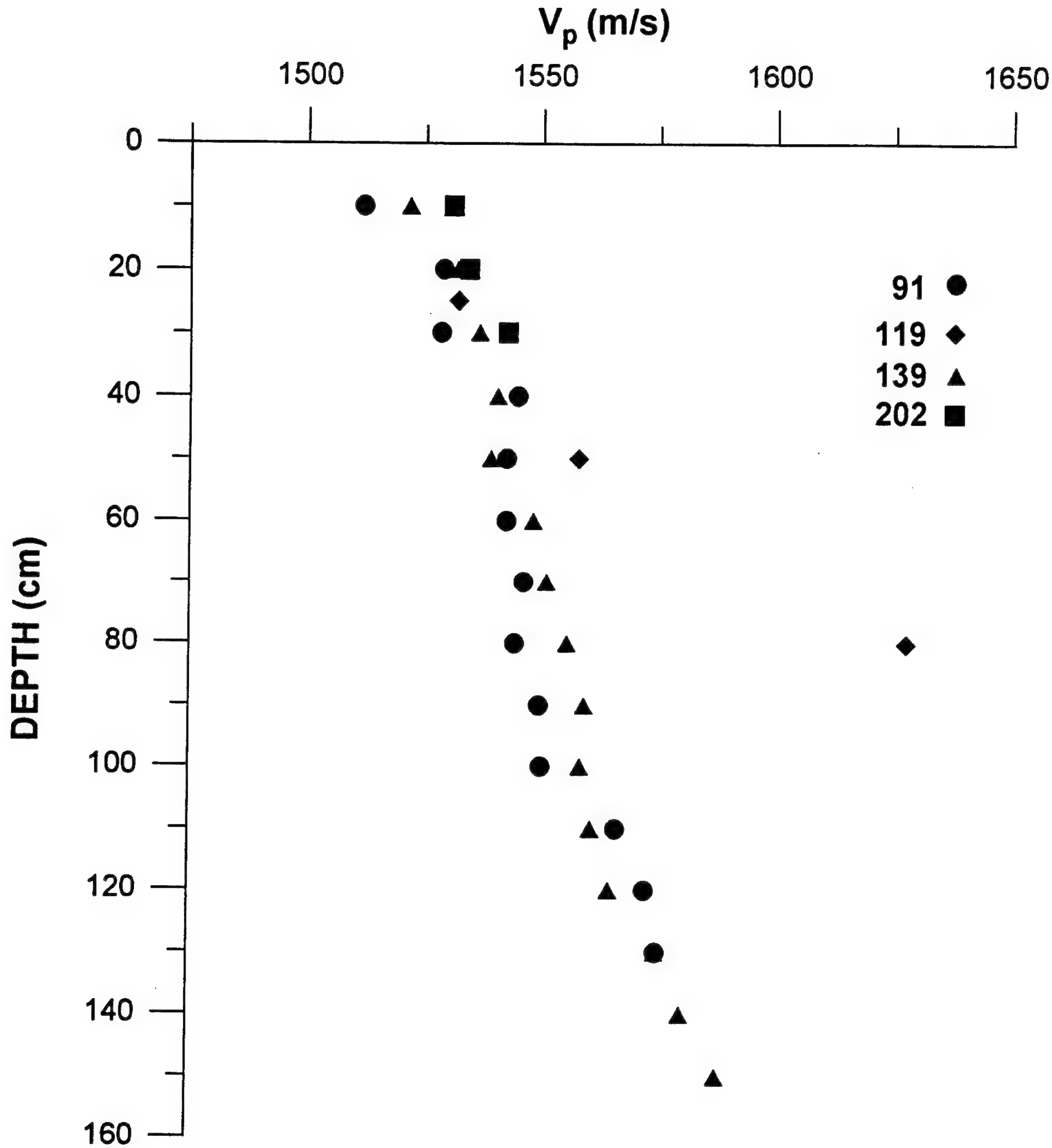


Figure 3.3.4 Gradient of compressional wave velocity (m/s) from carbonate sediments at the Planet site, Dry Tortugas, Florida Keys.

Table 3.3.1 Summary of values of in-situ sediment geoacoustic properties of the Key West Campaign

Station	V_p (m/s)		Alpha (dB/m)		V_s (m/s)	
	Mean	Range	Mean	Range	Mean	Range
236	1537	(1524-1555)	12.9	(10-18)	40.2	(28-56)
241	1545	(1526-1563)	12.7	(9-18)	52.5	(38-66)
242	1544	(1532-1559)	12.3	(9-17)	52.1	(46-60)
251	1541	(1530-1555)	14.7	(6-23)	57.7	(49-63)
253	1558	(1544-1571)	13.9	(7-18)	73.5	(62-88)
255	1581	(1566-1592)	23.2	(19-27)	92.8	(83-110)
257	1551	(1537-1562)	14.3	(9-18)	72.8	(61-97)
265	1672	(1642-1697)	28.8	(21-43)	98.8	(75-116)
266	1576	(1546-1637)	19.9	(8-35)	78.2	(51-118)
274	1573	(1552-1602)	15.4	(7-24)	75.1	(52-91)
280	1536	(1518-1548)	10.8	(3-16)	54.3	(39-67)
284	1567	(1551-1589)	14.6	(8-23)	85.1	(74-91)
286	1600	(1589-1616)	23.2	(19-28)	82.2	(77-91)
288	1697	(1668-1725)	18.1	(12-25)	143.8	(129-154)
290	1708	(1684-1728)	25.5	(14-33)	129.6	(123-140)

Table 3.3.2 Summary of near-surface sediment physical and geoacoustic properties at the Dry Tortugas site, Florida Keys

PARAMETER	MEAN	RANGE	STANDARD DEVIATION
LABORATORY MEASUREMENTS			
Porosity (%)	56.7	53.0-61.4	2.1
Grain Size (ϕ)	6.6	4.9-7.8	0.38
V_p (m/s)	1555	1546-1569	6.0
Att (dB/m @ 400 kHz)	354	298-405	29.5
IN-SITU MEASUREMENTS			
V_p (m/s)	1541	1518-1563	9.62
Att (dB/m @ 38 kHz)	12.2	3.4-23.5	3.14
V_s (m/s)	50.8	38.3-66.6	9.04

Table 3.3.3 Summary of near-surface sediment physical and geoacoustic properties at the Marquesas experimental site, Florida Keys

PARAMETER	MEAN	RANGE	STANDARD DEVIATION
LABORATORY MEASUREMENTS			
Porosity (%)*	57.8	51.4-70.1	4.76
Grain Size (ϕ)***	6.2	4.6-8.4	0.96
V_p (m/s)**	1551	1542-1559	4.32
Att (dB/m @ 400 kHz)**	329	241-494	57.9
IN-SITU MEASUREMENTS			
V_p (m/s)	1576	1547-1637	24.3
Att (dB/m @ 38 kHz)	19.9	8.4-34.4	6.0
V_s (m/s)	78.2	50.7-117.8	26.4

* based one core only
** based on two cores only
*** based on three cores

Table 3.3.4 Summary of near-surface sediment physical and geoacoustic properties near Rebecca Shoal, Florida Keys.

PARAMETER	MEAN	RANGE	STANDARD DEVIATION
LABORATORY MEASUREMENTS*			
Porosity (%)	42.3	39.6-45.1	1.79
Grain Size (ϕ)	1.2	0.9-1.47	0.13
V_p (m/s)	1715	1645-1759	24.82
Att (dB/m @ 400 kHz)	252	103-614	102.78
IN-SITU MEASUREMENTS			
V_p (m/s)	1703	1669-1728	17.05
Att (dB/m @ 38 kHz)	22.0	11.7-33.1	6.31
V_s (m s-1)	136.6	122-154	11.96

* based on two cores only

Table 3.3.5 Summary of near surface sediment physical and geoacoustic properties at Dry Tortugas hard sand site (#265), Florida Keys

PARAMETER	MEAN	RANGE	STANDARD DEVIATION
LABORATORY MEASUREMENTS*			
Porosity (%)	45.3	45.6-46.5	0.73
Grain Size (ϕ)	1.1	1.0-1.4	0.12
V_p (m/s)	1671	1651-1680	8.86
Att (dB/m @ 400 kHz)	319	261-512	74.57
IN-SITU MEASUREMENTS			
V_p (m/s)	1672	1643-1698	17.09
Att (dB/m @ 38 kHz)	28.8	20.6-43.2	7.19
V_s (m/s)	98.8	74.8-116.4	17.46

* based on one core only

Table 3.3.6. Gradients of compressional wave velocity (m/s) measured using Neptune at four locations near the "PLANET" site in the Dry Tortugas, Florida Keys. Probe distances were 50 cm and the transmit frequency was 38 kHz.

Station #	KW91	KW119	KW139	KW202
Depth (cm)				
10	1511.9		1521.6	1530.9
20	1528.9		1531.8	1534.3
25		1532.0		
30	1528.4		1536.6	1542.6
40	1544.9		1540.5	
50	1542.5	1558.0	1539.1	
60	1542.5		1548.3	
70	1546.3		1551.2	
75		1627.0		
80	1544.4	1628.0	1555.6	
90	1549.7		1559.4	
100	1550.2		1558.5	
110	1566.2		1560.9	
120	1572.5		1564.8	
130	1575.0		1574.9	
140			1580.3	
150			1588.0	

Table 3.3.7. Gradients of shear wave velocity (m/s) measured using GISSAMS at 3 locations near the "PLANET site" in carbonate sediments of the Florida Keys. Transmit and received probes were located 40 cm (N) and 100 cm (F) apart.

Station #	97N	97F	108N	108F	148N
Depth (cm)					
25	52.7				
50	79.3	84.5			73.1
75	84.6	85.1	82.6	68.4	
100	88.5	64.8	74.7		
125		89.5			

3.4 Sediment Chemistry and Mineralogy Measurements (Furukawa)

Locations of diver cores and box cores are shown in Figs. 3.4.1 and 3.4.2.

Sulfur speciation and pH

The results of aqueous sulfur speciation and pH analysis are shown in Table 3.4.1. Note that the detection limit is different for each sample due to the varied amounts of pore water samples recovered.

ICP analysis

The results of ICP analysis are shown in Table 3.4.2.

Total Organic Carbon (TOC)

The results of TOC analysis are shown in Table 3.4.3.

X-ray diffraction

The X-ray diffraction profiles of cores KW-PL-BC-141, 165, 194, 208 and KW-PL-DC-178 are shown in Figs. 3.4.3-3.4.7. The peaks indicate the presence of aragonite, HMC, LMC, and occasional minor quartz. The x-ray diffraction profiles of the gravity core, separated into clay-, silt-, and sand-sized grains, are shown in Figs. 3.4.8-3.4.10. They show the increase in the intensity of HMC peaks at depths.

Rietveld method of crystal structure refinement

The quantitative analysis using Rietveld method resulted in the HMC/LMC ratio shown in Fig. 3.4.11. The Mg contents of HMC calculated using the cell constants derived by the Rietveld method are shown in Fig. 3.4.12.

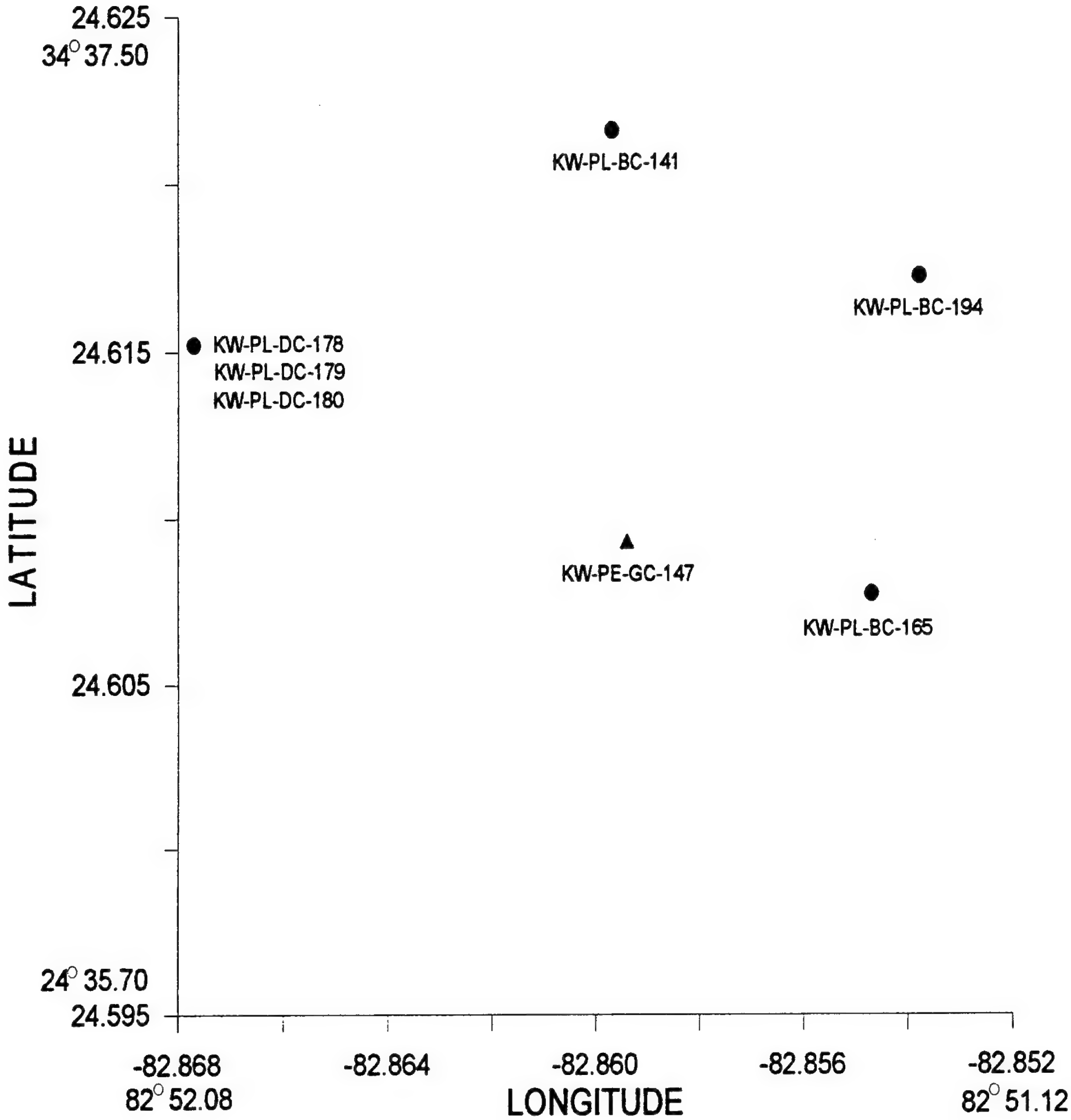


Figure 3.4.1 Dry Tortugas Test Site Geochemistry and Mineralogy Cores

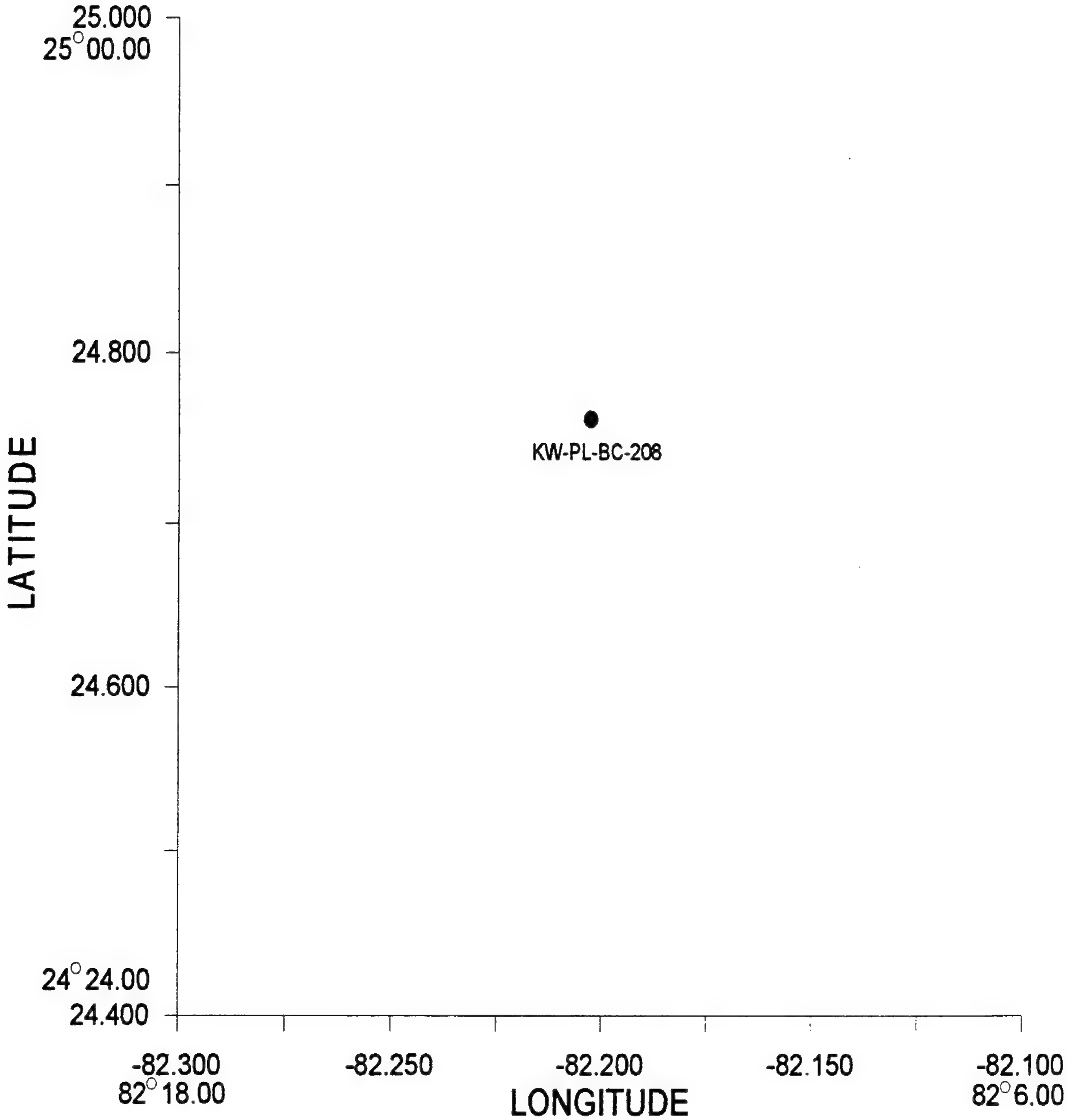


Figure 3.4.2 Marquesas Test Site GeochemistryCores

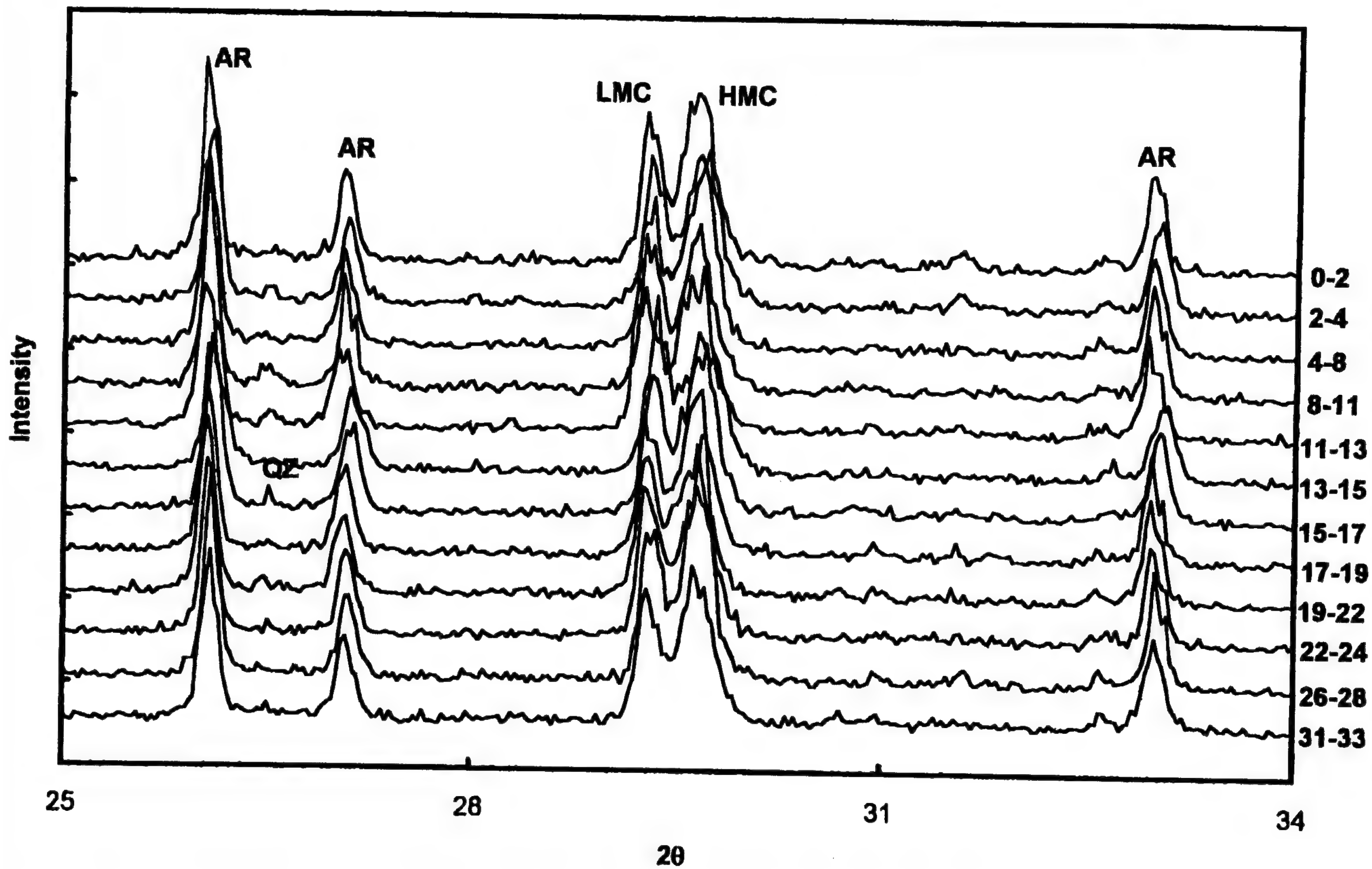


Figure 3.4.3 X-ray powder diffraction profiles of bulk sediment samples from KW-PL-BC-141. Sample depths are indicated on the right in terms of centimeters below seafloor. AR, aragonite; LMC, low-Mg calcite; HMC, high-Mg calcite; QZ, quartz.

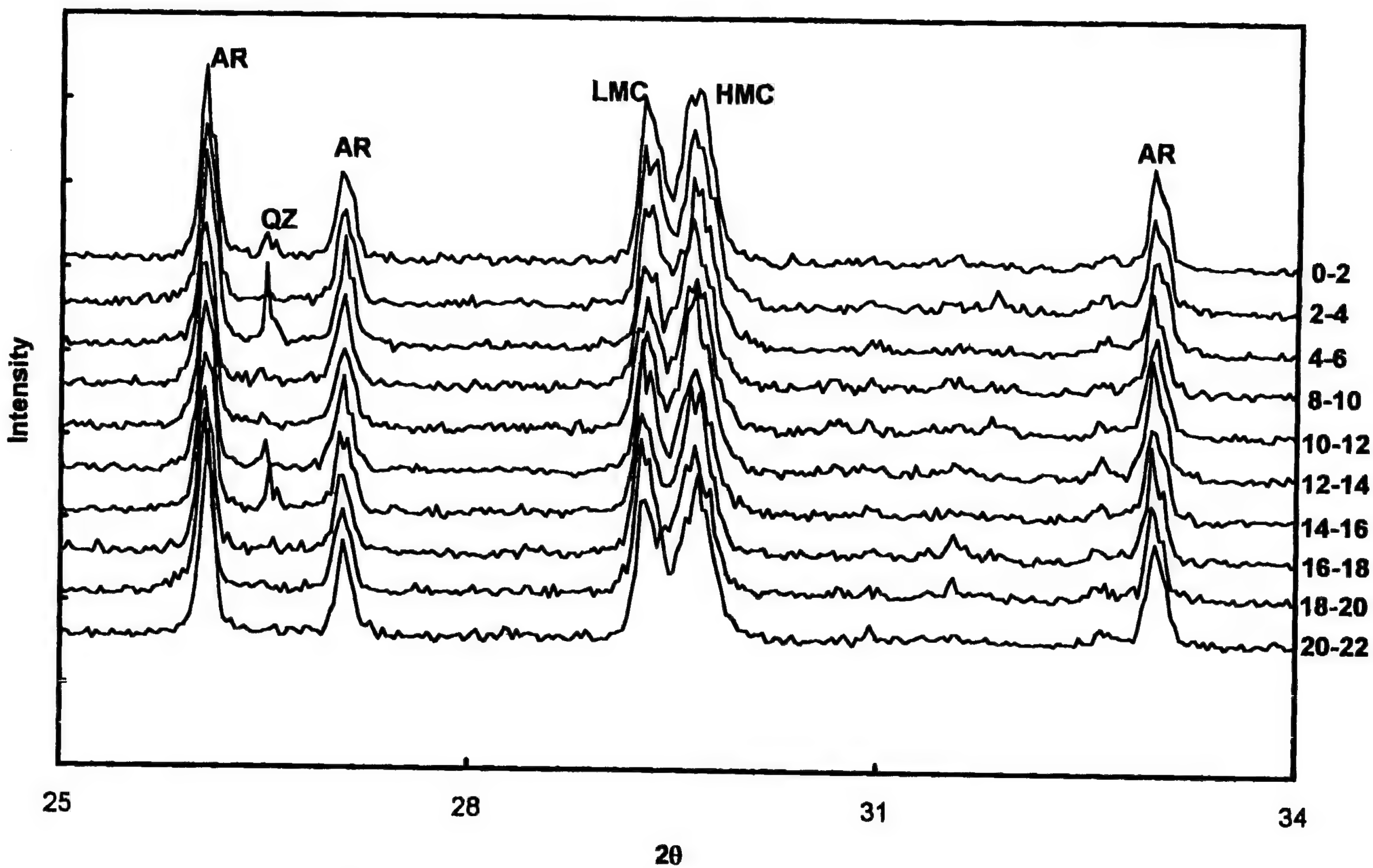


Figure 3.4.4 X-ray powder diffraction profiles of bulk sediment samples from KW-PL-BC-165. Sample depths are indicated on the right in terms of centimeters below seafloor. AR, aragonite; LMC, low-Mg calcite; HMC, high-Mg calcite; QZ, quartz.

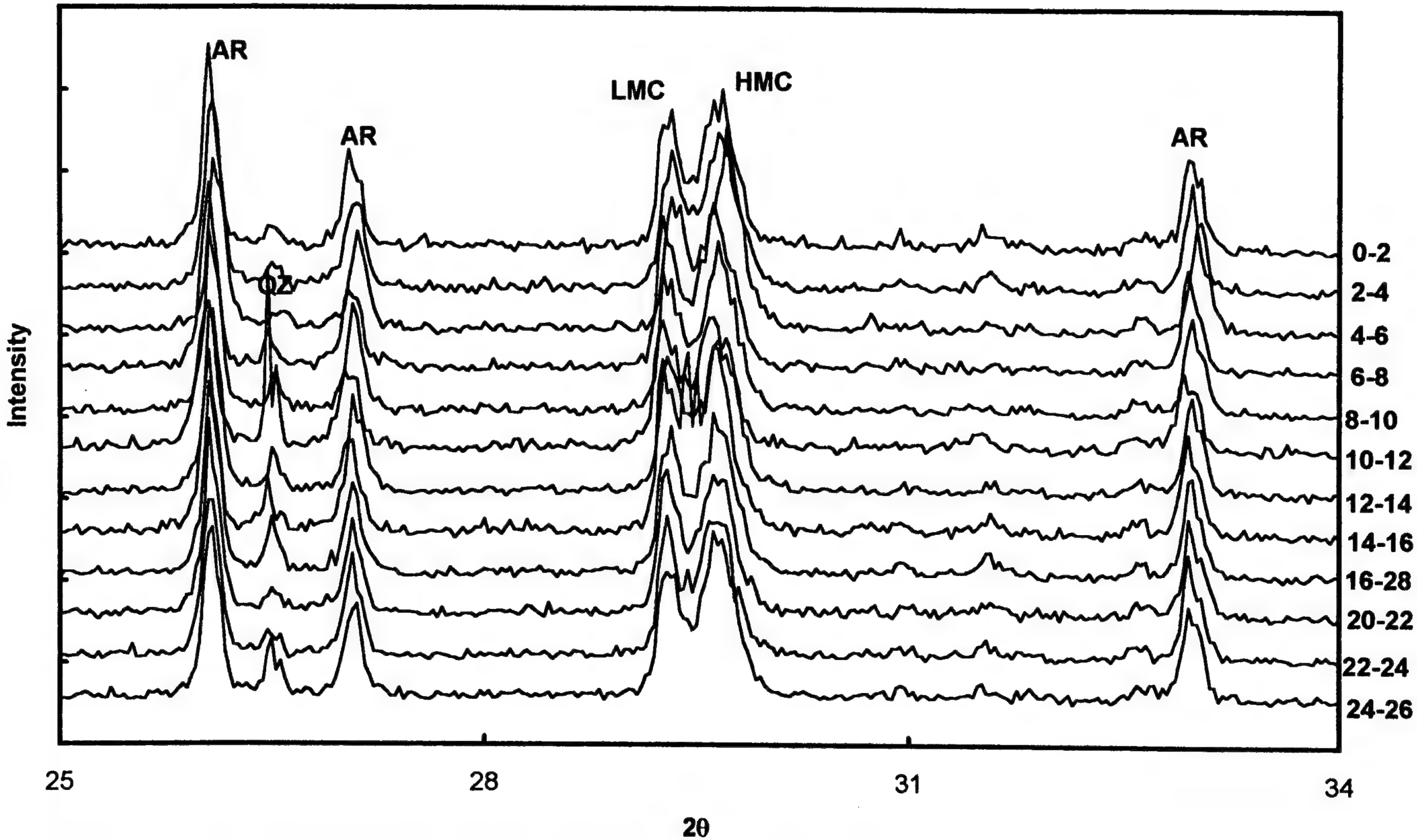


Figure 3.4.5 X-ray powder diffraction profiles of bulk sediment samples from KW-PL-BC-178. Sample depths are indicated on the right in terms of centimeters below seafloor. AR, aragonite; LMC, low-Mg calcite; HMC, high-Mg calcite; QZ, quartz.

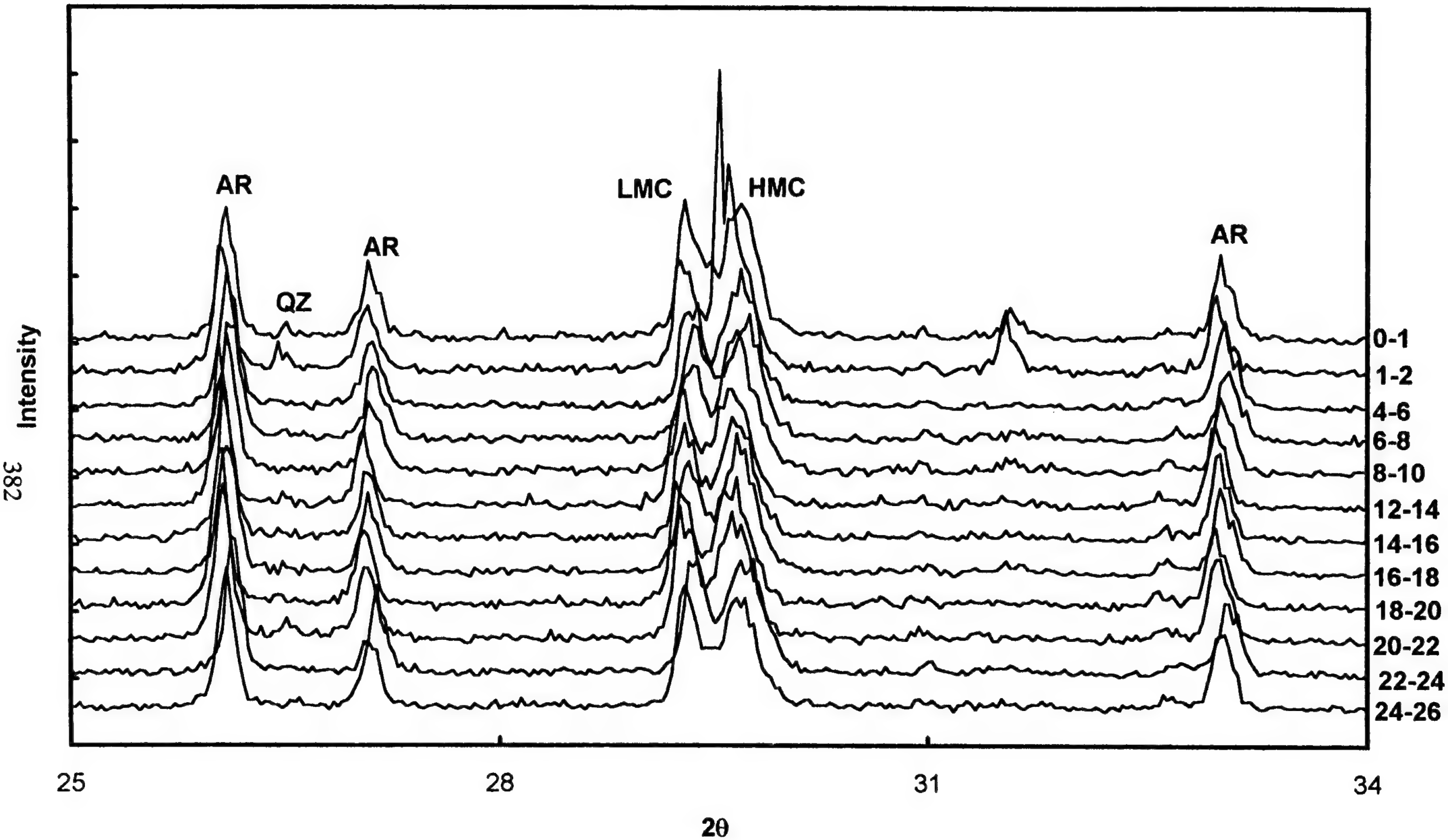


Figure 3.4.6 X-ray powder diffraction profiles of bulk sediment samples from KW-PL-BC-194. Sample depths are indicated on the right in terms of centimeters below seafloor. AR, aragonite; LMC, low-Mg calcite; HMC, high-Mg calcite; QZ, quartz.

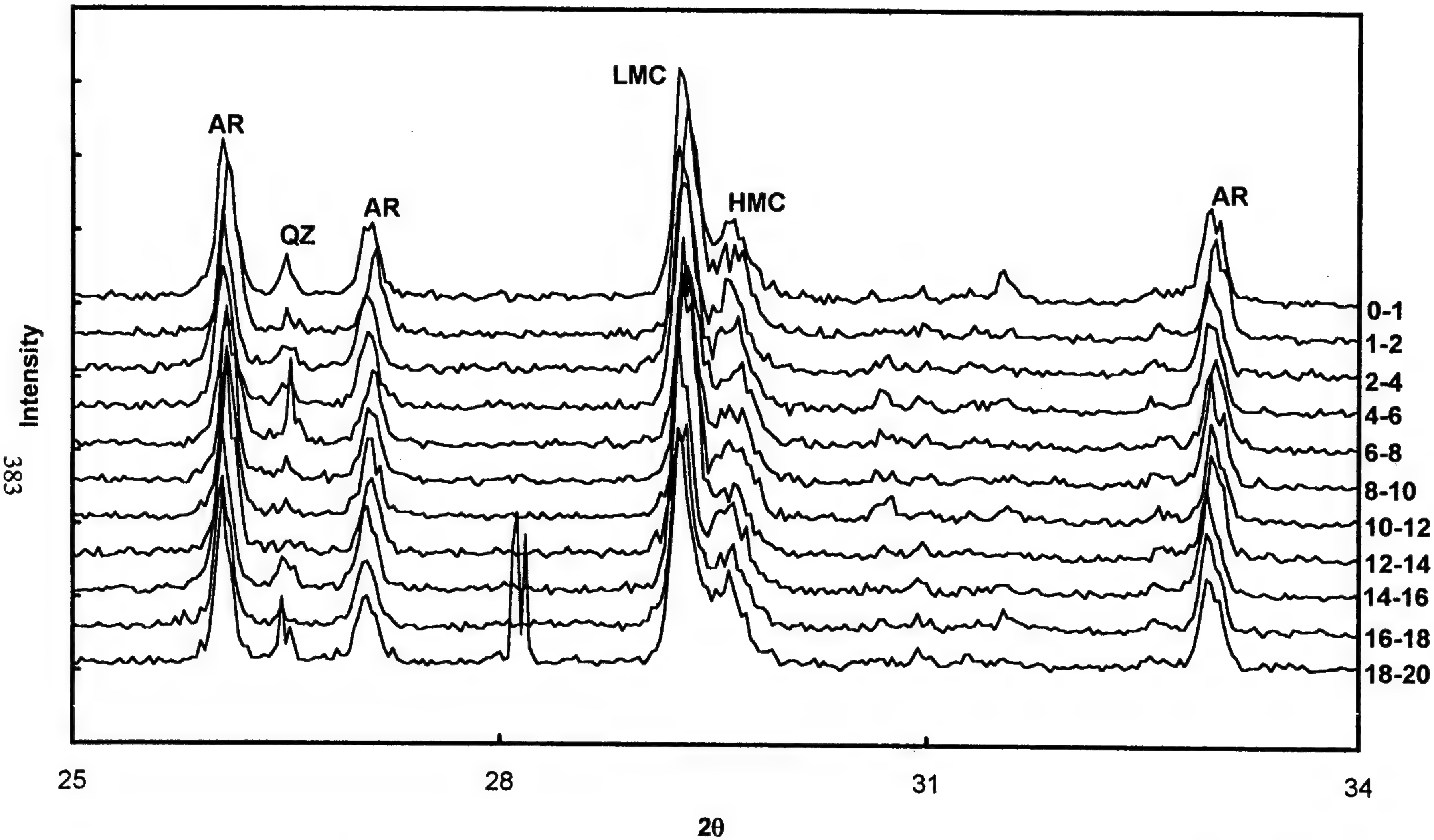


Figure 3.4.7 X-ray powder diffraction profiles of bulk sediment samples from KW-PL-BC-208. Sample depths are indicated on the right in terms of centimeters below seafloor. AR, aragonite; LMC, low-Mg calcite; HMC, high-Mg calcite; QZ, quartz.

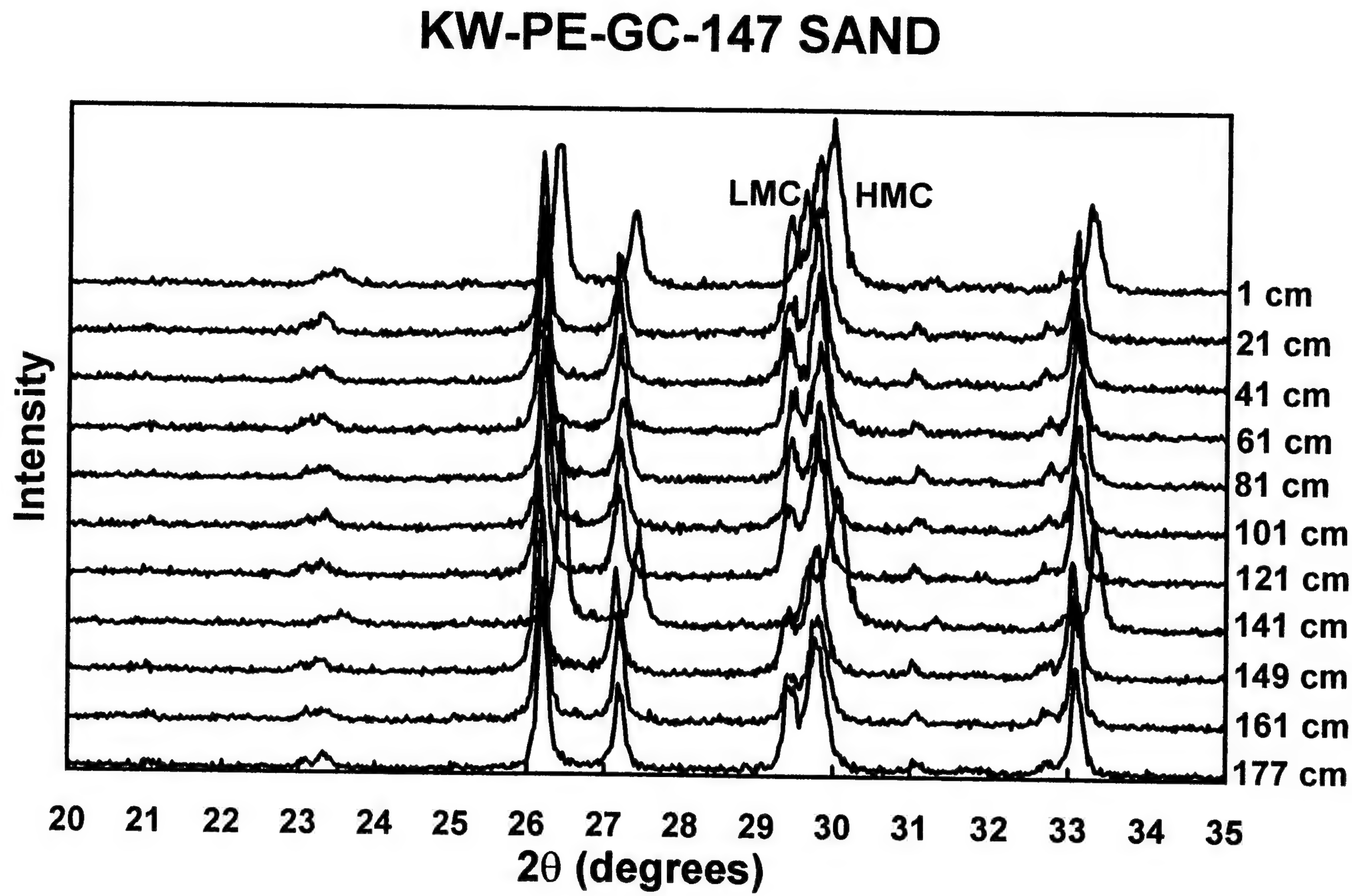


Figure 3.4.8 X-ray powder diffraction profiles of sand-sized samples from KW-PE-GC-147.

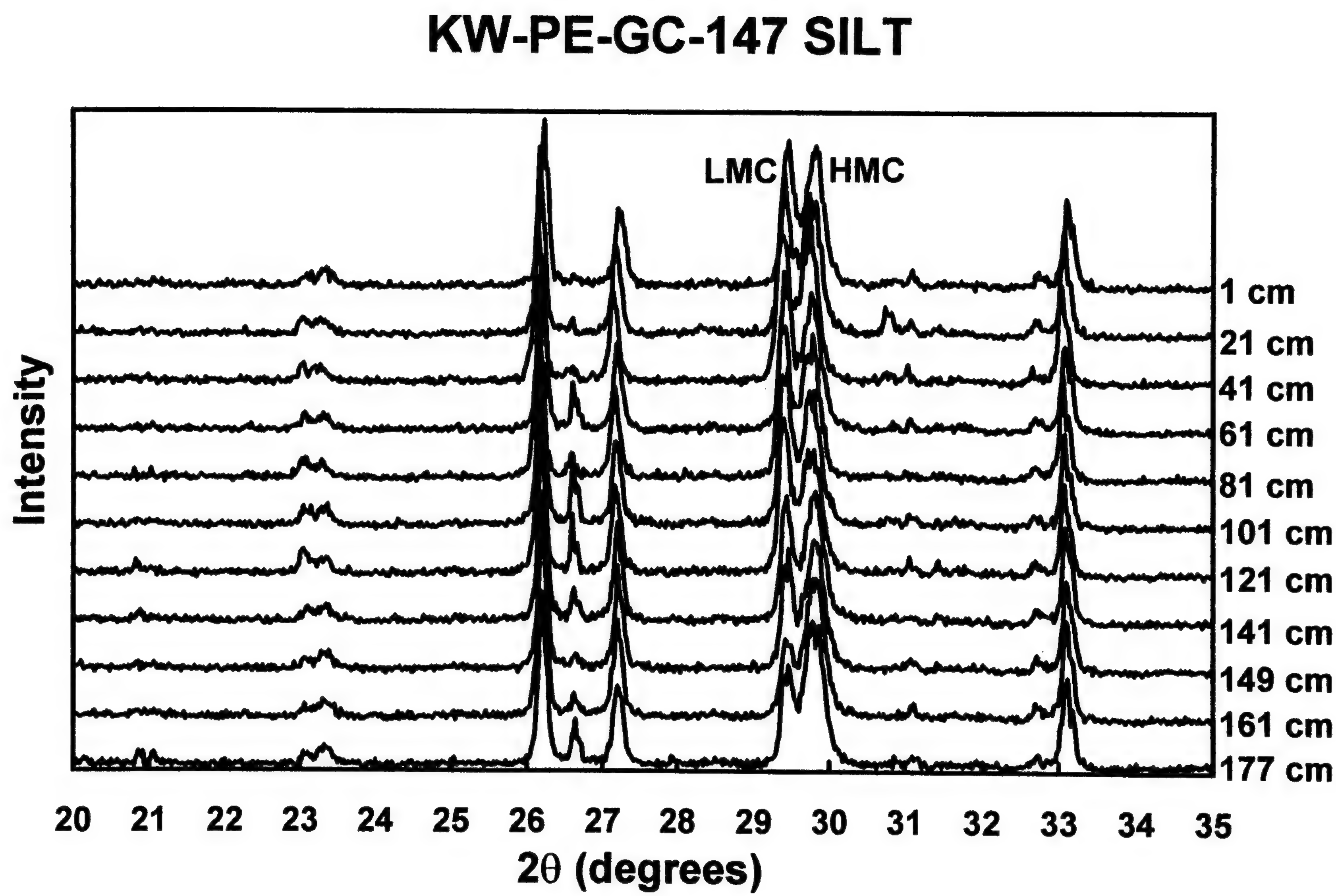


Figure 3.4.9 X-ray powder diffraction profiles of silt-sized samples from KW-PE-GC-147.

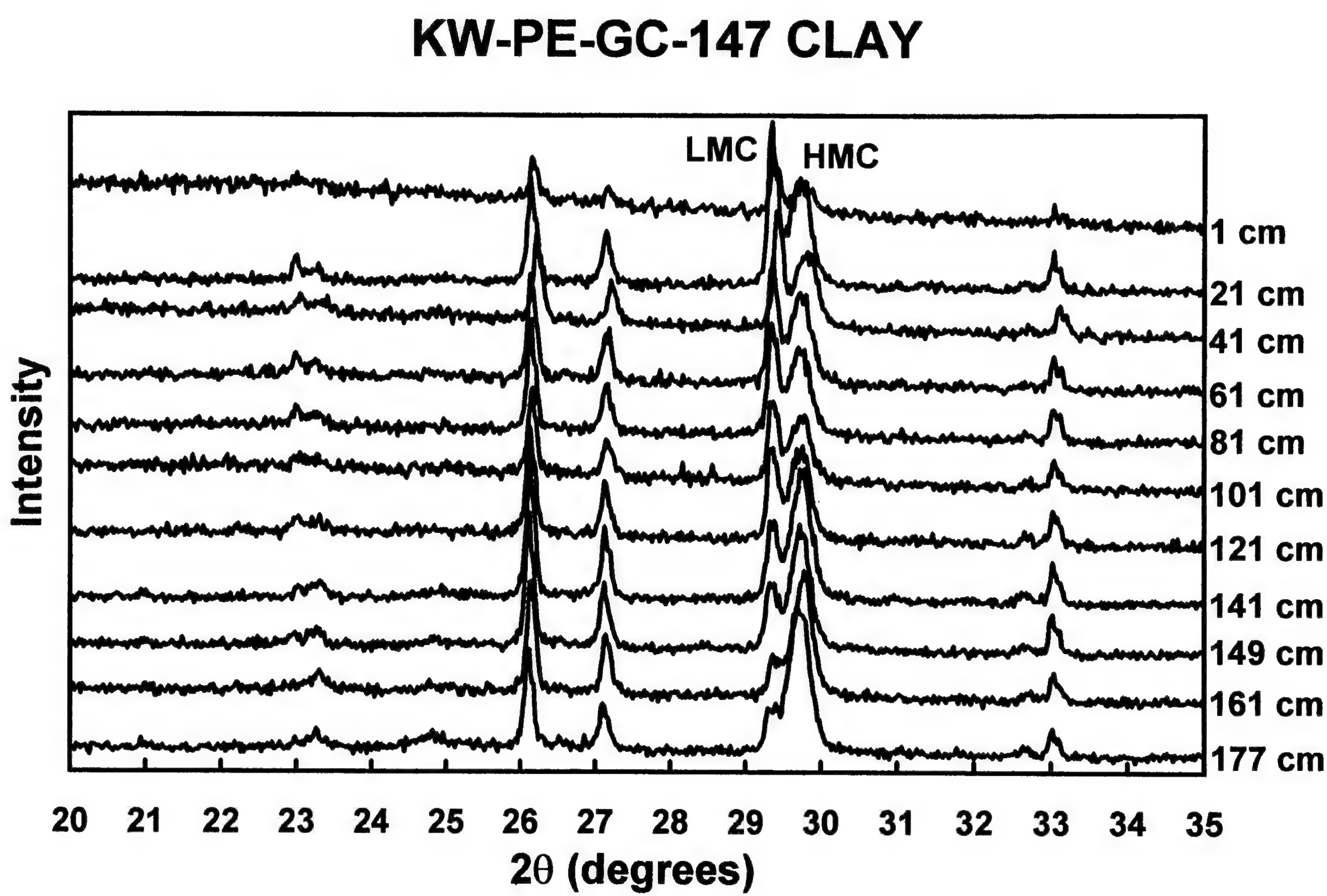


Figure 3.4.10 X-ray powder diffraction profiles of clay-sized samples from KW-PE-GC-147.

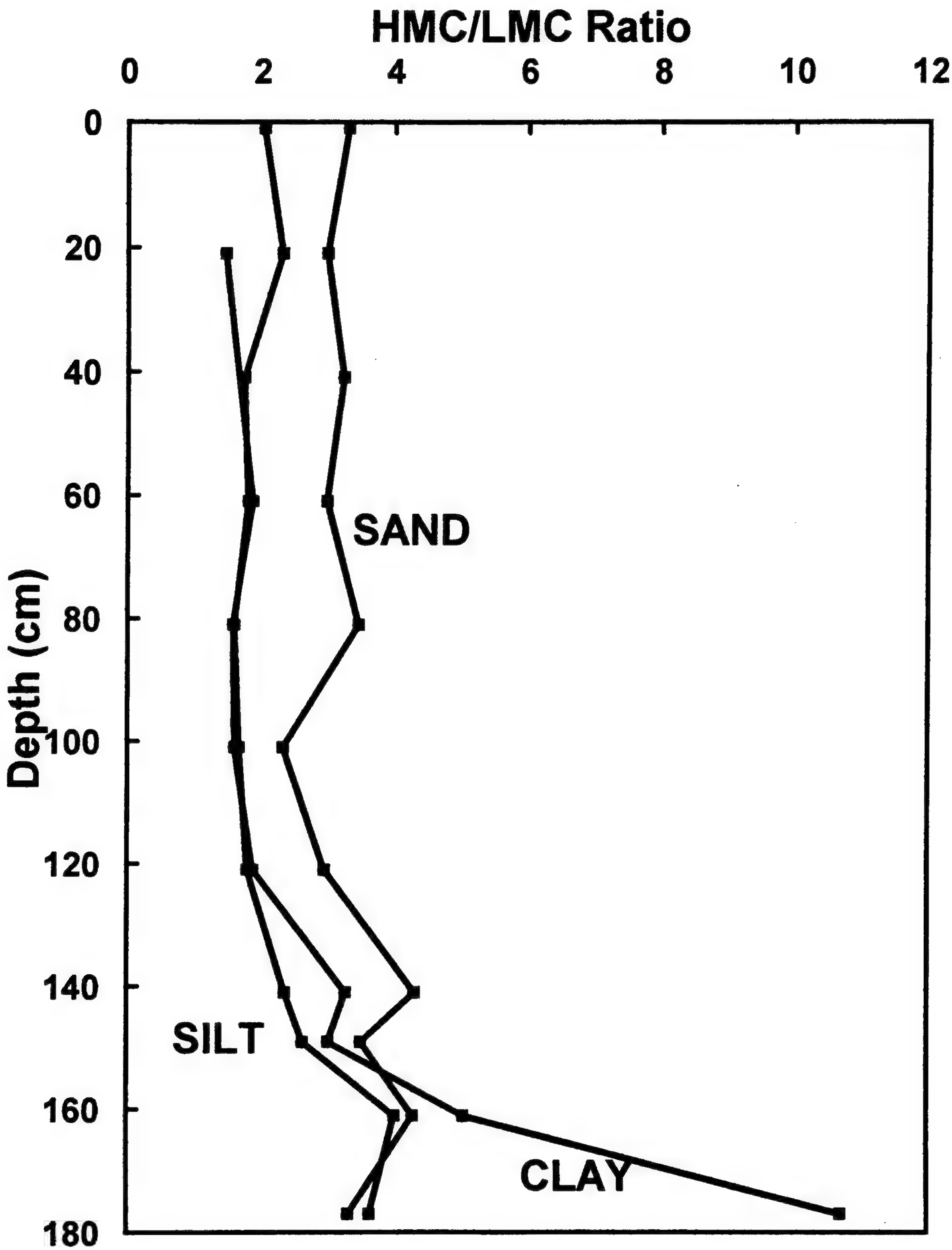


Figure 3.4.11 HMC/LMC ratio of sand-, silt-, and clay-sized samples from KW-PE-GC-147.

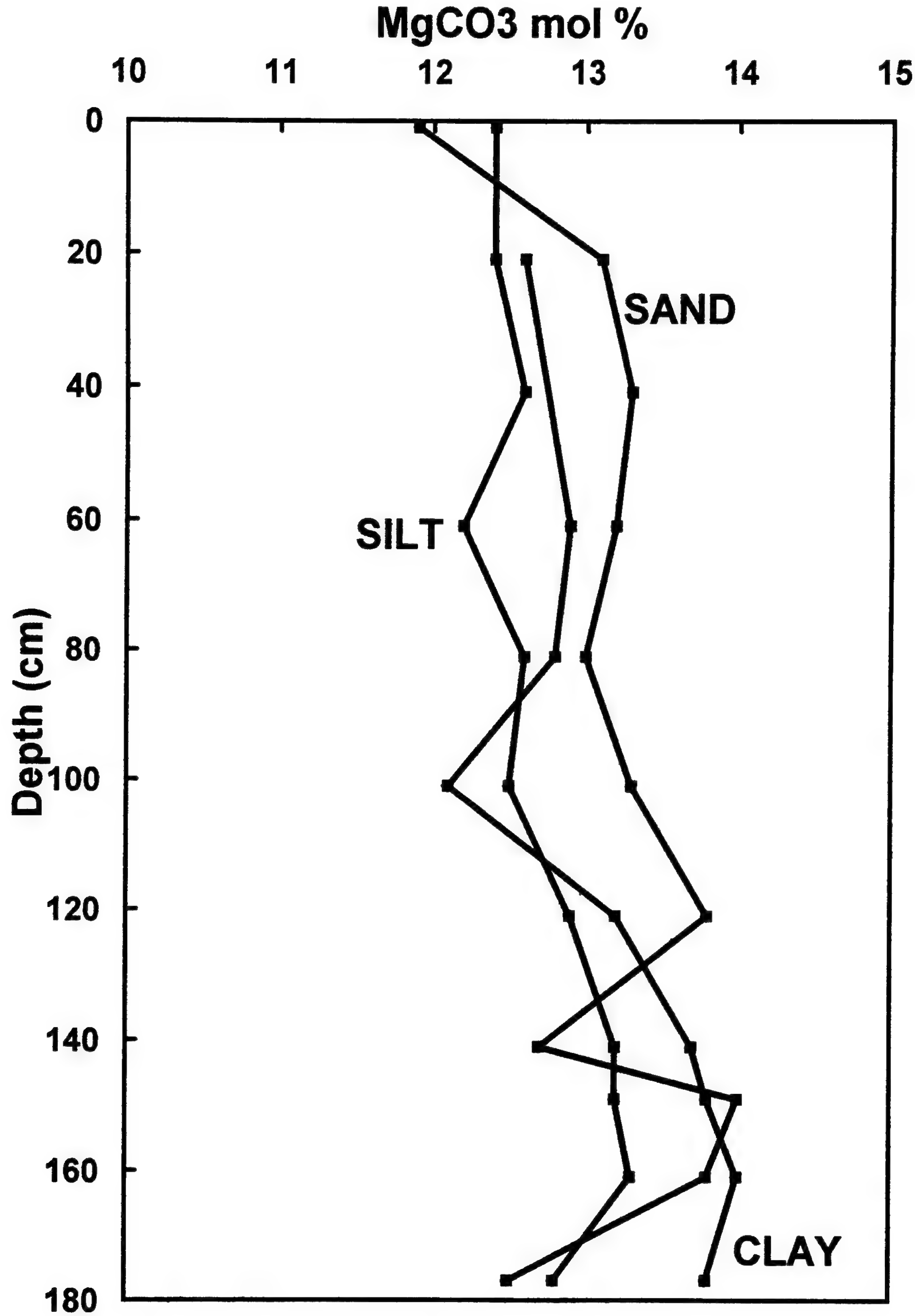


Figure 3.4.12 Mg contents of HMC in samples from KW-PE-GC-147.

Table 3.4.1. Results of aqueous sulfur speciation and pH analysis

Core ID	Depth (cm)	Σreduced* (mM)	Intermediate** (mM)	pH
KW-PL-BC-141	1	<0.1		
	2			7.63
	6			7.69
	7	0.1		
	10			7.66
	13	<0.2		
	14			7.74
	18	0.4		7.79
	22	0.8		7.76
	26	0.2		
	30	0.9		
KW-PL-BC-165	3	<0.02		7.63
	7	<0.02		7.88
	11	<0.02		7.77
	15	<0.02		
	19	0.04		7.84
	28	0.02		
KW-PL-DC-180	1			7.53
	3		0.01	
	5			7.67
	7		0.04	
	9			7.68
	11		0.05	
	13			7.75
	15	0.11	0.06	
	17			7.71
	19		0.07	
	22			7.80
	24		0.04	
KW-PL-BC-194	3	<0.02	0.01	7.76
	7	0.04	0.03	7.57
	11	0.04	0.03	7.74
	15		0.03	7.80
	18			7.93
	19		0.03	
	22			7.82
	23	0.10		
	26			7.77
	28		<0.03	
KW-PL-BC-208	1			7.74
	5			7.72
	13			8.05
	17			7.96
	22			7.99

*Σreduced sulfur=$\Sigma[S^{2-}]+[S_2O_3^{2-}]+[SO_3^{2-}]$

**Intermediate sulfur=$[S_2O_3^{2-}]+[SO_3^{2-}]$

Table 3.4.2. The results of ICP analysis

KW-PL-BC-141								
Depth (cm)	B (ppb)	Ca (ppm)	K (ppm)	Li (ppb)	Mg (ppm)	Na (ppm)	Si (ppm)	Sr (ppb)
2	3700	460	410	<200	1300	9800	5	8400
6	4600	520	470	200	1400	11000	4.9	9500
10	3900	470	420	210	1300	10000	4.1	8400
14	4000	470	420	<200	1300	10000	4.9	8500
18	3900	470	420	<200	1300	10000	4.7	8200
22	4100	490	450	210	1400	11000	5.3	8500

KW-PL-BC-165								
Depth (cm)	B (ppb)	Ca (ppm)	K (ppm)	Li (ppb)	Mg (ppm)	Na (ppm)	Si (ppm)	Sr (ppb)
3	4000	500	450	230	1400	11000	5.7	8900
7	4500	540	490	270	1500	12000	5.1	9300
11	4200	510	470	<200	1400	11000	4.3	8900
15	3500	470	430	240	1300	10000	4.5	7800
19	4100	510	460	220	1500	11000	4.2	8700
24	4000	500	450	<200	1400	11000	3.3	8300

KW-PL-DC-179								
Depth (cm)	B (ppb)	Ca (ppm)	K (ppm)	Li (ppb)	Mg (ppm)	Na (ppm)	Si (ppm)	Sr (ppb)
1	3600	520	440	220	1400	11000	4.3	8800
5	4000	510	450	220	1400	11000	5.8	8700
9	3600	470	410	200	1300	10000	5.1	8000
13	3500	470	410	<200	1300	10000	3.5	7900
17	3700	470	430	200	1400	10000	3.8	7900
22	3900	500	450	<200	1400	11000	3.7	8500

KW-PL-BC-194								
Depth (cm)	B (ppb)	Ca (ppm)	K (ppm)	Li (ppb)	Mg (ppm)	Na (ppm)	Si (ppm)	Sr (ppb)
3	3900	520	450	200	1400	11000	4.8	8900
7	3800	510	440	260	1400	11000	8.3	8600
11	3900	500	440	200	1400	11000	4.8	8600
15	3500	460	410	200	1300	9800	3.6	7800
18	4400	540	480	<200	1500	11000	3.2	9300
22	3700	480	420	<200	1400	10000	3	8200
26	3300	450	400	210	1300	9600	2.9	7600

KW-PL-BC-208								
Depth (cm)	B (ppb)	Ca (ppm)	K (ppm)	Li (ppb)	Mg (ppm)	Na (ppm)	Si (ppm)	Sr (ppb)
1	3700	480	430	<200	1400	10000	4.6	8400
5	3200	440	390	<200	1200	9300	9	7400
13	3200	440	410	<200	1300	9600	5.1	7400
17	3400	470	410	200	1300	10000	4.9	7700
22	3900	520	470	220	1500	11000	4.6	8600

Table 3.4.3. Results of total organic carbon analysis

KW-PL-BC-194		
	Depth (cm)	TOC (weight%)
	1	0.41
	3	0.28
	7	0.26
	11	0.31
	15	0.26
	19	0.30
	25	0.20

4.0 Acknowledgments

The authors wish to thank the captains and crews of the *WFS Planet* and *R/V Pelican*, without whose help we could not have collected the data contained herein. Many thanks to the scientific crews who aided in the core collections and probe deployments. Thanks are also due to Ricky Ray, Tracy Brantley, Leona Cole, Billy Chambless, and Mary Steelman for their competent work in the laboratory and at the computer. This work is supported by the Office of Naval Research under the CBBL research program.

5.0 References

Boyce, R. E. "Appendix I. Definitions and Laboratory Techniques of Compressional Sound Velocity Parameters and Wet-water Content, Wet Bulk Density, and Porosity Parameters by Gravimetric and Gamma Ray Attenuation Techniques," in *Initial Reports DSDP*, Schlanger, S. O., E. D. Jackson, et al.(eds.), Vol.33: Washington (U.S. Government Printing Office), pp. 931-958, 1976.

Briar, H., K. Bills, and R. A. Schapery, "Design and Test of the Operational In-Situ Gauge for Solid Propellant Surveillance," TR-76-36, Air Force Rocket Propulsion Laboratory, Edwards AFB, CA 1976.

Briggs, K. B., "High-Frequency Acoustic Scattering from Sediment Interface Roughness and Volume Inhomogeneities," NRL/FR/7431-94-9617, Naval Research Laboratory, Stennis Space Center, MS, 1994.

Bryan, G. M. and R. D. Stoll, "The Dynamic Shear Modulus of Marine Sediments," *Journal of the Acoustic Society of America* **83**(6), 2159-2164 (1988).

Folk, R. L., "Petrology of Sedimentary Rocks," Hemphill Publishing Co., Austin, TX, pp. 3-37, 1974.

Folk, R. L., "Petrology of Sedimentary Rocks," Hemphill Publishing Co., Austin, TX, 159 p, 1965.

Folk, R. L. and W. C. Ward, "Brazos River Bar, A Study in the Significance of Grain Size Parameters," *J. Sediment. Petrol.* **27**, 3-26 (1957).

Fonselius, S. H., "Determination of Hydrogen Sulphide," in *Methods of Seawater Analysis*, 2nd Rev., Chap. 6. K. Grasshoff et al. (eds.), Weinheim, Verlag Chemie, 1983.

Grasshoff, K., "Determination of Thiosulphate," in *Methods of Seawater Analysis*, 2nd Rev., Chap. 5. K. Grasshoff et al. (eds.), Weinheim, Verlag Chemie, 1983.

Griffin, S. R., F. B. Grosz, and M. D. Richardson, "ISSAMS: A Remote In Situ Sediment Acoustic Measurement System," *Sea Technology,* April 1996.

Hamilton, E. L., "Compressional Wave Attenuation in Marine Sediments," *Geophysics* **37**, 620-646 (1972).

Hamilton, E.L., "Elastic Properties of Marine Sediments," *Journal of Geophysical Research* **76**(2), 579-603 (1971).

Jahnke R. A., "A Simple, Reliable, and Inexpensive Pore-Water Sampler," *Limnol. Oceanogr.* **33**, 483-487 (1988).

Lambert, D. N. and R. H. Bennett, "Tables for Determining Porosity of Deep-Sea Sediments from Water Content and Average Grain Density Measurements," NOAA Tech. Memo. ERL/AOML-17, National Oceanic and Atmospheric Administration, Miami, FL, 57p., 1972.

Monney, N. T., "An Analysis of the Vane Shear Test at Varying Rates of Shear," in *Deep-Sea Sediments, Physical and Mechanical Properties*, A. L. Inderbitzen (ed.), Plenum Press, New York, NY, pp. 151-167, 1974.

Presley, B. J., "A Simple Method for Determining Calcium Carbonate in Sediment Samples," *Journal of Sedimentary Petrology*, **45**,(3), 745-746 (1975).

Quantachrome Corporation, Ultrapycnometer - 1000. Operation Manual, 1995.

Richardson, M. D., "Spatial Variability of Surficial Shallow Water Geoacoustic Properties," in *Ocean Seismo-Acoustics*, Akal, T. and J. M. Berkson (eds.), Plenum Press, New York, NY, pp. 527-536, 1986.

Richardson, M. D., "Coastal Benthic Boundary Layer Special Research Program: A Review of the Second Year," NRL/MR/7431--95-7595, Naval Research Laboratory, Stennis Space Center, MS, 1995.

Richardson, M. D., K. B. Briggs, R. I. Ray, and W. H. Jahn, "Environmental Support for High-Frequency Acoustic Experiments Conducted at the Quinault Range, April-May 1983," NORDA Report No. 132, Naval Research Laboratory, Stennis Space Center, MS, 1986.

Richardson, M. D., E. Muzi, B. Miaschi, and F. Turgutcan, "Shear Wave Gradients in Near-Surface Marine Sediment," in *Shear Waves in Marine Sediments*, Hovem, J. M., M. D. Richardson, R. D. Stoll (eds.), Kluwer Academic Publishers, Dordrecht, The Netherlands, pp. 295-304, 1991.

Richardson, M. D., S. R. Griffin, and F. B. Gross., "ISSAMS: An In-Situ Sediment Acoustic Measurement System," In *Proceedings of an International Conference on Underwater Acoustics*, University of New South Wales, Sydney, Australian Acoustical Society, pp. 104-106, 1994.

Young, R. A., A. Sakthivel, T. S. Moss, and C. O. Pavia-Santos, "User's Guide to Program DBWS9411 for Rietveld Analysis of X-Ray and Neutron Powder Diffraction Patterns with a 'PC' and Various Other Computers," School of Physics, Georgia Institute of Technology, Atlanta, GA, 1994.